55-1520-237-23-6

TM 55-1520-237-23-6

TECHNICAL MANUAL

AVIATION UNIT AND INTERMEDIATE MAINTENANCE

POWERPLANT, FUEL, AND RELATED SYSTEMS MAINTENANCE TASK MANUAL

UH-60A HELICOPTER

This copy is a reprint which includes current pages from Changes 1 through 26.

HEADQUARTERS
DEPARTMENT OF THE ARMY
29 DECEMBER 1978

D101.11:

AVUM **AVIM**

READEX FICHE best copy available

This manual is published for the use of all concerned.

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General, United States Army
Chief of Staff

Official:

J. C. PENNINGTON
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31 Organizational Maintenance requirements for UH-60A aircraft.

TM 55-1520-237-23-6
C 25

CHANGE }
No. 25 }

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DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 29 February 1988

Aviation Unit and Intermediate Maintenance

POWERPLANT, FUEL, AND RELATED SYSTEMS MAINTENANCE TASK MANUAL

UH-60A AND EH-60A HELICOPTERS

TM 55-1520-237-23-6, 29 December 1978, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
i and ii	i and ii
2-1 and 2-2	2-1 and 2-2
2-7 and 2-8	2-7 and 2-8
5-1 through 5-4	5-1 through 5-4
5-5 and 5-6	5-5 and 5-6
13-1 and 13-2	13-1 and 13-2
13-2.1/13-2.2	13-2/13-2.2
13-31 and 13-32	13-31 and 13-32
13-35 through 13-37/13-38	13-35 through 13-37/13-38
14-2.1/14-2.2	14-2.1/14-2.2
14-3 and 14-4	14-3 and 14-4
- - -	14-4.1/14-4.2

Remove Pages	Insert Pages
14-5 through 14-12	14-5 through 14-12
14-21 through 14-24	14-21 through 14-24
14-36.7 through 14-36.10	14-36.7 through 14-36.10
14-43 and 14-44	14-43 and 14-44
14-47 and 14-48	14-47 and 14-48
14-55 and 14-56	14-55 and 14-56
16-1 and 16-2	16-1 and 16-2
- - -	16-2.1 and 16-2.2
16-3 and 16-4	16-3 and 16-4
17-1 and 17-2	17-1 and 17-2
20-3 and 20-4	20-3 and 20-4
20-13 and 20-14	20-13 and 20-14
20-27 and 20-28	20-27 and 20-28
20-28.1/20-28.2	20-28.1/20-28.2

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Chief of Staff

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The Adjutant General

DISTRIBUTION:

To be distributed in accordance with DA Form 12-31, AVUM and AVIM Maintenance requirements for UH-60A Helicopter, Utility (BLACKHAWK) and EH-60A Helicopter, Electronic Countermeasure.

Introduction

This **Maintenance Task Manual** contains information for the maintenance specialists to do specific maintenance tasks. The manual is individual, self-contained, and task-oriented for MOS 68B. It covers removal, installation, repair, and adjustment instructions written simply. Refer to Army Regulations and Operator's Manual for personnel requirements and procedures for ground run and flight checking the helicopter.

All the requirements for doing each task are listed at the beginning of the tasks under the headings **PERSONNEL REQUIRED, SUPPLIES, TOOLS,** and items **ALSO NEEDED.**

PERSONNEL REQUIRED requirements give the recommended MOSs needed. Through cross-training, individuals with different MOSs may be qualified to do a specific task.

Acceptance/Rejection information in text, such as wear limits, fits, tolerances, and torque values, is indicated by **boldface** type. This type highlights the information.

This manual is one of a set of 13 separate manuals that cover maintenance instructions for the model UH-60A helicopters. The 13 manuals are:

Introduction (Cont)

Wiring Data Manual	TM 55-1520-237-23-1
Aircraft General Information Manual	TM 55-1520-237-23-2
Aircraft Fault Isolation Procedures Manual	TM 55-1520-237-23-3
Maintenance Task Manual, Servicing, Ground Handling, Special Inspections, and General Maintenance	TM 55-1520-237-23-4
Maintenance Task Manual, Airframe and Landing Gear	TM 55-1520-237-23-5
Maintenance Task Manual, Powerplant, Fuel, and Related Systems	TM 55-1520-237-23-6
Maintenance Task Manual, Powertrain	TM 55-1520-237-23-7
Maintenance Task Manual, Hydraulics and Flight Controls	TM 55-1520-237-23-8
Maintenance Task Manual, Electrical and Instruments	TM 55-1520-237-23-9
Maintenance Task Manual, Structural Repair	TM 55-1520-237-23-10
Avionics General Information Manual	TM 11-1520-237-23-1
Avionics Fault Isolation Procedures Manual	TM 11-1520-237-23-2
Maintenance Task Manual, Avionics	TM 11-1520-237-23-3

These manuals contain maintenance data through the Aviation Intermediate Maintenance (AVIM) support level. They do not have depot level maintenance instructions.

The **Wiring Data Manual,** TM 55-1520-237-23-1, has wire lists and general wiring repair instructions for the entire helicopter.

The **General Information Manuals,** TM 55-1520-237-23-2 and TM 11-1520-237-23-1, contain descriptions and theories of operation of helicopter systems and major components. The Aircraft General Information Manual covers the entire helicopter, except for avionics systems. The Avionics General Information Manual covers only avionics.

URGENT

NOTE: **THIS CHANGE HAS BEEN PRINTED AND DISTRIBUTED OUT OF SEQUENCE. IT SHOULD BE INSERTED IN THE MANUAL AND USED. UPON RECEIPT OF THE EARLIER SEQUENCED CHANGE INSURE A MORE CURRENT CHANGE PAGE IS NOT REPLACED WITH A LESS CURRENT PAGE.**

TM 55-1520-237-23-6
C 26

CHANGE
NO. 26

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DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 30 March 1988

Aviation Unit and Intermediate Maintenance

POWERPLANT, FUEL, AND RELATED SYSTEMS
MAINTENANCE TASK MANUAL

UH-60A and EH-60A HELICOPTERS

TM 55-1520-237-23-6, 29 December 1978, is changed as follows:

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URGENT

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2-19 and 2-20	2-19 and 2-20

3. Retain this sheet in front of manual for reference purposes.

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DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, AVUM and AVIM requirements for UH -60A Helicopter, Utility (BLACKHAWK) and EH-60A Electronic Countermeasure.

TM 55-1520-237-23-6
TO 1H-60(U)A-2-6
C 24

CHANGE }
NO. 24 }

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DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 8 December 1987

Aviation Unit and Intermediate Maintenance

POWERPLANT, FUEL, AND RELATED SYSTEMS MAINTENANCE TASK MANUAL

UH-60A and EH-60A HELICOPTERS

TM 55-1520-237-23-6/TO 1H-60(U)A-2-6, 29 December 1978, is changed as follows:

1. Title has been changed to read as stated above.

2. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
1-15 and 1-16	1-15 and 1-16
1-16.1/1-16.2	1-16.1/1-16.2
2-1 and 2-2	2-1 and 2-2
2-19 and 2-20	2-19 and 2-20
4-7 through 4-10	4-7 through 4-10
4-10.1 and 4-10.2	4-10.1 and 4-10.2
4-15 and 4-16	4-15 and 4-16
6-1 and 6-2	6-1 and 6-2
6-2.1 and 6-2.2	6-2.1 and 6-2.2

Remove pages	Insert pages
7-1 and 7-2	7-1 and 7-2
7-2.1 and 7-2.2	7-2.1 and 7-2.2
7-3 and 7-4	7-3 and 7-4
10-1 and 10-2	10-1 and 10-2
10-7 and 10-8	10-7 and 10-8
---	10-8.1/10-8.2
10-13 through 10-15/10-16	10-13 through 10-15/10-16
13-3 and 13-4	13-3 and 13-4
13-12 and 13-13	13-12 and 13-13
14-7 and 14-8	14-7 and 14-8
14-51 and 14-52	14-51 and 14-52
19-1 and 19-2	19-1 and 19-2
19-11 through 19-16	19-11 through 19-16
20-18.1 and 20-18.2	20-18.1 and 20-18.2
20-29 and 20-30	20-29 and 20-30
20-33 and 20-34	20-33 and 20-34
20-53 and 20-54	20-53 and 20-54
26-1 and 26-2	26-1 and 26-2

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TM 55-1520-237-23-6
TO 1H-60(U)A-2-6
C 23

CHANGE }
NO. 23 }

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WASHINGTON, D.C., 27 May 1987

Aviation Unit and Intermediate Maintenance

POWERPLANT, FUEL, AND RELATED SYSTEMS MAINTENANCE TASK MANUAL

UH-60A HELICOPTER

TM 55-1520-237-23-6/TO 1H-60(U)A-2-6, 29 December 1978, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
vii and viii	vii and viii
ix and x	ix and x
1-7 and 1-8	1-7 and 1-8
1-11 and 1-12	1-11 and 1-12
1-12.1 and 1-12.2	1-12.1 and 1-12.2
1-15 and 1-16	1-15 and 1-16
---	1-18.1/1-18.2

Remove pages	Insert pages
1-19 and 1-20	1-19 and 1-20
3-1 through 3-5/3-6	3-1 through 3-5/3-6
4-1 and 4-2	4-1 and 4-2
4-15 and 4-16	4-15 and 4-16
5-1 through 5-4	5-1 through 5-4
5-5 and 5-6	5-5 and 5-6
7-1 and 7-2	7-1 and 7-2
7-2.1 and 7-2.2	7-2.1 and 7-2.2
7-3 and 7-4	7-3 and 7-4
7-5 and 7-6	7-5 and 7-6
8-7 and 8-8	8-7 and 8-8
8-8.1/8-8.2	8-8.1/8-8.2
10-1 and 10-2	10-1 and 10-2
10-7 and 10-8	10-7 and 10-8
10-10.1/10-10.2	10-10.1/10-10.2
10-11 through 10-14	10-11 through 10-14
13-1 and 13-2	13-1 and 13-2
13-2.1/13-2.2	13-2.1/13-2.2
13-3 and 13-4	13-3 and 13-4
---	13-4.1/13-4.2
13-7 and 13-8	13-7 and 13-8
13-8.1/13-8.2	13-8.1/13-8.2
13-9 through 13-12	13-9 through 13-12
13-17 through 13-22	13-17 through 13-22

Remove pages	Insert pages
13-22.1/13-22.2	13-22.1/13-22.2
13-24.1 through 13-24.4	13-24.1 through 13-24.2
13-25 and 13-26	13-25 and 13-26
13-26.1/13-26.2	13-26.1 and 13-26.2
---	13-30.1/13-30.2
13-31 through 13-36	13-31 through 13-36
---	13-37/13-38
14-1 and 14-2	14-1 and 14-2
14-2.1/14-2.2	14-2.1/14-2.2
14-3 through 14-14	14-3 through 14-14
14-14.1 through 14-14.3/14-14.4	---
14-15 through 14-26	14-15 through 14-26
14-26.1/14-26.2	---
14-27 through 14-36	14-27 through 14-36
---	14-36.1 through 14-36.10
14-43 and 14-44	14-43 and 14-44
---	14-44.1/14-44.2
14-47 and 14-48	14-47 and 14-48
15-1 and 15-2	15-1 and 15-2
---	15-2.1 and 15-2.2
15-3 and 15-4	15-3 and 15-4
15-13 and 15-14	15-13 and 15-14
15-17 and 15-18	15-17 and 15-18
15-18.1/15-18.2	15-18.1/15-18.2
15-19 and 15-20	15-19 and 15-20

Remove pages	Insert pages
15-23 through 15-26	15-23 through 15-26
17-3 through 17-5/17-6	17-3 through 17-5/17-6
18-1 and 18-2	18-1 and 18-2
---	18-2.1/18-2.2
18-3 and 18-4	18-3 and 18-4
19-5 and 19-6	19-5 and 19-6
19-8.1/19-8.2	19-8.1/19-8.2
19-9 and 19-10	19-9 and 19-10
19-16.1/19-16.2	19-16.1/19-16.2
19-17 and 19-18	19-17 and 19-18
20-1 through 20-4	20-1 through 20-4
20-4.1/20-4.2	20-4.1/20-4.2
20-5 and 20-6	20-5 and 20-6
---	20-6.1/20-6.2
20-7 through 20-10	20-7 through 20-10
20-23 through 20-26	20-23 through 20-26
20-30.1/20-30.2	20-30.1/20-30.2
20-33 through 20-36	20-33 through 20-36
20-43 through 20-46	20-43 through 20-46
20-55 and 20-56	20-55 and 20-56
21-1 and 21-2	21-1 and 21-2
22-1 and 22-2	22-1 and 22-2
22-5 and 22-6	22-5 and 22-6

Remove pages	Insert pages
23-1 through 23-4	23-1 through 23-4
24-3 through 24-5/24-6	24-3 through 24-5/24-6
25-5 and 25-6	25-5 and 25-6
--	25-6.1/25-6.2

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TM 55-1520-237-23-6
TO 1H-60(U)A-2-6
C 22

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DEPARTMENT OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 6 April 1987

Aviation Unit and Intermediate Maintenance

POWERPLANT, FUEL, AND RELATED SYSTEMS MAINTENANCE TASK MANUAL

UH-60A HELICOPTER

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Remove pages	Insert pages
iii through vi	iii through vi
1-1 and 1-2	1-1 and 1-2

URGENT

Remove pages	Insert pages
1-2.1 and 1-2.2	1-2.1 and 1-2.2
1-7 and 1-8	1-7 and 1-8
1-13 and 1-14	1-13 and 1-14
2-1 through 2-22	2-1 through 2-22

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TM 55-1520-237-23-6
TO 1H-60(U)A-2-6
C 21

CHANGE }
NO. 21 }

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WASHINGTON, D.C., 28 March 1987

Aviation Unit and Intermediate Maintenance

POWERPLANT, FUEL, AND RELATED SYSTEMS MAINTENANCE TASK MANUAL

UH-60A HELICOPTER

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Remove pages	Insert pages
6-1 and 6-2	6-1 and 6-2
6-2.1/6-2.2	6-2.1 and 6-2.2
6-3 and 6-4	6-3 and 6-4
25-1 through 25-4	25-1 through 25-4
- - -	25-4.1 and 25-4.2
25-7 and 25-8	25-7 and 25-8

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TM 55-1520-237-23-6
TO 1H-60(U)A-2-6
C 20

CHANGE }
NO. 20 }

HEADQUARTERS
DEPARTMENT OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 20 August 1986

Aviation Unit and Intermediate Maintenance

POWERPLANT, FUEL, AND RELATED SYSTEMS MAINTENANCE TASK MANUAL

UH-60A HELICOPTER

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Remove pages	Insert pages
1-11 and 1-12	1-11 and 1-12
2-1 and 2-2	2-1 and 2-2
2-6.1/2-6.2	2-6.1 and 2-6.2
2-7 and 2-8	2-7 and 2-8
2-9/2-10	2-9 and 2-10
4-1 and 4-2	4-1 and 4-2
4-7 and 4-8	4-7 and 4-8
4-10.1 and 4-10.2	4-10.1 and 4-10.2
4-11 and 4-12	4-11 and 4-12

Remove pages	Insert pages
5-4.1/5-4.2	5-4.1/5-4.2
5-5 and 5-6	5-5 and 5-6
5-11 and 5-12	5-11 and 5-12
7-2.1/7-2.2	7-2.1 and 7-2.2
7-3 and 7-4	7-3 and 7-4
8-5 and 8-6	8-5 and 8-6
10-3 and 10-4	10-3 and 10-4
----	10-4.1/10-4.2
10-5 and 10-6	10-5 and 10-6
----	10-10.1/10-10.2
10-11 through 10-14	10-11 through 10-14
13-5 and 13-6	13-5 and 13-6
13-9 and 13-10	13-9 and 13-10
13-15 and 13-16	13-15 and 13-16
14-1 and 14-2	14-1 and 14-2
14-2.1/14-2.2	14-2.1/14-2.2
14-13 and 14-14	14-13 and 14-14
14-14.3/14-14.4	14-14.3/14-14.4
14-19 and 14-20	14-19 and 14-20
18-1 through 18-5/18-6	18-1 through 18-5/18-6
19-1 and 19-2	19-1 and 19-2
19-9 and 19-10	19-9 and 19-10
19-11 through 19-14	19-11 through 19-14
19-14.1/19-14.2	19-14.1/19-14.2

Remove pages	Insert pages
20-1 through 20-4	20-1 through 20-4
20-5 through 20-8	20-5 through 20-8
20-19 through 20-22	20-19 through 20-22
22-1 and 22-2	22-1 and 22-2
22-5 and 22-6	22-5 and 22-6
26-1 and 26-2	26-1 and 26-2

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TM 55-1520-237-23-6
TO 1H-60(U)A-2-6
C 19

CHANGE NO. 19

HEADQUARTERS
DEPARTMENT OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 5 May 1986

Aviation Unit and Intermediate Maintenance

POWERPLANT, FUEL, AND RELATED SYSTEMS MAINTENANCE TASK MANUAL

UH-60A HELICOPTER

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1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
xi and xii	xi and xii
1-1 and 1-2	1-1 and 1-2
1-2.1 and 1-2.2	1-2.1 and 1-2.2
1-3 and 1-4	1-3 and 1-4
---	1-6.1/1-6.2
1-7 and 1-8	1-7 and 1-8
1-11 through 1-16	1-11 through 1-16

Remove pages	Insert pages
----	1-16.1/1-16.2
1-19 and 1-20	1-19 and 1-20
2-3 and 2-4	2-3 and 2-4
2-4.1/2-4.2	2-4.1 and 2-4.2
----	2-4.3 and 2-4.4
2-9/2-10	2-9 and 2-10
4-7 and 4-8	4-7 and 4-8
4-13 and 4-14	4-14 and 4-14
----	4-14.1 and 4-14.2
4-15 and 4-16	4-15 and 4-16
----	4-16.1/14-6.2
5-1 through 5-4	5-1 through 5-4
----	5-8.1/5-8.2
5-9 and 5-10	5-9 and 5-10
5-10.1/5-10.2	5-10.1/5-10.2
5-11 and 5-12	5-11 and 5-12
7-3 and 7-4	7-3 and 7-4
7-5 and 7-6	7-5 and 7-6
7-6.1/7-6.2	----
7-7/7-8	7-7/7-8
8-1 through 8-8	8-1 through 8-8
8-9 and 8-10	8-9 and 8-10
8-12.1/8-12.2	8-12.1 and 8-12.2
8-13 and 8-14	8-13 and 8-14
8-14.1/8-14.2	8-14.1 and 8-14.2

Remove pages	Insert pages
8-15 and 8-16	8-15 and 8-16
8-16.1/8-16.2	8-16.1 and 8-16.2
8-17 and 8-18	8-17 and 8-18
----	8-21 through 8-23/8-24
9-5/9-6	9-5/9-6
10-3 and 10-4	10-3 and 10-4
13-1 and 13-2	13-1 and 13-2
----	13-2.1/13-2.2
13-3 through 13-6	13-3 through 13-6
13-9 and 13-10	13-9 and 13-10
13-27 through 13-34	13-27 through 13-34
14-1 and 14-2	14-1 and 14-2
14-23 and 14-24	14-23 and 14-24
----	14-26.1/14-26.2
14-27 and 14-28	14-27 and 14-28
14-45 through 14-52	14-45 through 14-52
14-55 and 14-56	14-55 and 14-56
15-3 and 1-54	15-3 and 15-4
15-5 and 15-6	15-5 and 15-6
----	15-6.1/15-6.2
15-7 and 15-8	15-7 and 15-8
15-17 and 15-18	15-17 and 15-18
15-19 through 15-24	15-19 through 15-24
16-1 through 16-4	16-1 through 16-4

Remove pages	Insert pages
19-1 and 19-2	19-1 and 19-2
19-7 and 19-8	19-7 and 19-8
19-8.1/19-8.2	19-8.1/19-8.2
19-9 and 19-10	19-9 and 19-10
19-15 and 19-16	19-15 and 19-16
20-1 through 20-4	20-1 through 20-4
----	20-4.1/20-4.2
----	20-12.1/20-12.2
20-13 and 20-14	20-13 and 20-14
20-18.1/20-18.2	20-18.1 and 20-18.2
20-21 and 20-22	20-21 and 20-22
20-22.1/20-22.2	20-22.1/20-22.2
20-23 and 20-24	20-23 and 20-24
20-45 through 2-48	20-45 through 20-48
20-55 and 20-56	20-55 and 20-56
----	20-57/20-58
21-1 through 21-4	21-1 through 21-4
22-1 and 22-2	22-1 and 22-2
22-5 and 22-6	22-5 and 22-6
22-6.1/22-6.2	22-6.1 and 22-6.2
23-1 through 23-6	23-1 through 23-6
25-1 and 25-2	25-1 and 25-2
25-5 and 25-6	25-5 and 25-6
25-7/25-8	25-7 and 25-8
----	25-9/25-10

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DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, AVUM and AVIM requirements for UH-60A Helicopter, Utility (BLACKHAWK).

URGENT

TM 55-1520-237-23-6
TO 1H-60(U)A-2-6
C 18

CHANGE

NO. 18

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 20 June 1985

Aviation Unit and Intermediate Maintenance

POWERPLANT, FUEL, AND RELATED SYSTEMS MAINTENANCE TASK MANUAL

UH-60A HELICOPTER

TM 55-1520-237-23-6, 29 December 1978, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
v and vi	v and vi
2-1 and 2-2	2-1 and 2-2
2-11 through 2-14	2-11 through 2-14

2. Retain these sheets in front of manual for reference purposes.

TM 55-1520-237-23-6
TO 1H-60(U)A-2-6
C 18

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TM 55-1520-237-23-6
TO 1H-60(U)A-2-6
C 17

CHANGE
NO. 17

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 23 March 1984

Aviation Unit and Intermediate Maintenance

POWERPLANT, FUEL, AND RELATED SYSTEMS
MAINTENANCE TASK MANUAL

UH-60A HELICOPTER

TM 55-1520-237-23-6, 29 December 1978, is changed as follows:

1. Remove and insert pages as indicated below.

Remove pages	Insert pages
a and b	a and b

2. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

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DISTRIBUTION:
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TM 55-1520-237-23-6
TO 1H-60(U)A-2-6
C 16

CHANGE
NO. 16

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 9 March 1984

Aviation Unit and Intermediate Maintenance

POWERPLANT, FUEL, AND RELATED SYSTEMS MAINTENANCE TASK MANUAL

UH-60A HELICOPTER

TM 55-1520-237-23-6, 29 December 1978, is changed as follows:

1. Remove and insert pages as indicated below.

	Remove pages	Insert pages
Table of Contents	vii thru x	vii thru x
Task 1	1-2.1 and 1-2.2	1-2.1 and 1-2.2
	1-11 and 1-12	1-11 thru 1-12.2
	1-19 and 1-20	1-19 and 1-20
Task 2	2-1 thru 2-2.1/2-2.2	2-1 thru 2-2.2
	2-3 and 2-4	2-3 thru 2-4.4
Task 10	10-2.1/10-2.2 thru 10-6	10-2.1/10-2.2 thru 10-6
	10-7 and 10-8	10-7 and 10-8
Task 13	13-1 and 13-2	13-1 thru 13-2.1/13-2.2
	13-3 thru 13-8.1/13-8.2	13-3 thru 13-8.1/13-8.2
	13-23 thru 13-24.1/13-24.2	13-23 thru 13-24.4

	Remove pages	Insert pages
Task 13	13-25 and 13-26	13-25 thru 13-26.1/13-26.2
	13-27 thru 13-32	13-27 thru 13-32
Task 14	14-1 thru 14-4	14-1 thru 14-4
	---	14-14.1 thru 14-14.3/14-14.4
	14-31 thru 14-34	14-31 thru 14-34
	---	14-49 thru 14-56
Task 15	15-1 thru 15-4	15-1 thru 15-4
	15-7 thru 15-10	15-7 thru 15-10
	15-15 and 15-16	15-15 thru 15-16.1/15-16.2
	15-17 and 15-18	15-17 thru 15-18.1/15-18.2
	15-19 and 15-20	15-19 and 15-20
Task 20	20-30.1/20-30.2	20-30.1/20-30.2
	20-31 and 20-32	20-31 and 20-32
Task 26	26-1 thru 26-3/26-4	26-1 thru 26-3/26-4

2. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

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TM 55-1520-237-23-6
TO 1H-60(U)A-2-6
C 15

CHANGE
No. 15

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 12 October 1983

Aviation Unit and Intermediate Maintenance

POWERPLANT, FUEL, AND RELATED SYSTEMS MAINTENANCE TASK MANUAL

UH-60A HELICOPTER

TM 55-1520-237-23-6, 29 December 1978, is changed as follows:

1. Remove and insert pages as indicated below.

	Remove pages	Insert pages
Table of Contents	v and vi	v thru vi.1/vi.2
	ix thru xii	ix thru xii
Task 1	1-1 thru 1-2.2	1-1 thru 1-2.2
	1-5 and 1-6	1-5 and 1-6
	---	1-8.1/1-8.2
	1-9 and 1-10	1-9 and 1-10
	1-13 and 1-14	1-13 and 1-14
	1-19 thru 1-23/1-24	1-19 and 1-20
Task 2	2-5 thru 2-6.2	2-5 thru 2-6.2
Task 4	4-1 and 4-2	4-1 and 4-2
	---	4-17/4-18
Task 9	9-1 thru 9-5/9-6	9-1 thru 9-5/9-6

	Remove pages	Insert pages
Task 12	12-1 and 12-2	12-1 and 12-2
Task 14	14-1 and 14-2	14-1 thru 14-2.1/14-2.2
	14-3 and 14-4	14-3 and 14-4
	---	14-37 thru 14-40.1/14-40.2
	---	14-41 thru 14-48
Task 19	19-5 thru 19-6.1/19-6.2	19-5 thru 19-6.1/19-6.2
	19-10.1/19-10.2 thru 19-12	19-10.1/19-10.2 thru 19-12
Task 20	20-27 and 20-28	20-27 thru 20-28.1/20-28.2
	---	20-30.1/20-30.2
	20-31 and 20-32	20-31 and 20-32
Task 22	22-1 thru 22-6	22-1 thru 22-6.1/22-6.2
Task 25	---	25-1 thru 25-7/25-8
Task 26	---	26-1 thru 26-3/26-4

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URGENT

NOTICE: Change 14 is being printed prior to Change 13 because of priority. Change 13 will be forthcoming. TM changes must be inserted in numerical sequence.

TM 55-1520-237-23-6
TO 1H-60(U)A-2-6
C 14

CHANGE
NO. 14

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., *24 February 1983*

Aviation Unit and Intermediate Maintenance
POWERPLANT, FUEL, AND RELATED SYSTEMS
MAINTENANCE TASK MANUAL

UH-60A HELICOPTER

TM 55-1520-237-23-6, 29 December 1978, is changed as follows:

1. Remove and insert pages as indicated below.

	Remove pages	Insert pages
Task 17	17-1 and 17-2	17-1 and 17-2
Task 19	19-3 and 19-4	19-3 thru 19-4.1/19-4.2
	19-15 and 19-16	19-15 thru 19-16.1/19-16.2
Task 20	20-11 thru 20-14	20-11 thru 20-14

URGENT

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3. Retain these sheets in front of manual for reference purposes.

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TM 55-1520-237-23-6
TO 1H-60(U)A-2-6
C 13

CHANGE }
NO. 13 }

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 23 February 1983

Aviation Unit and Intermediate Maintenance
POWERPLANT, FUEL, AND RELATED SYSTEMS
MAINTENANCE TASK MANUAL

UH-60A HELICOPTER

TM 55-1520-237-23-6, 29 December 1976, is changed as follows:

1. Remove and insert pages as indicated below.

	Remove Pages	Insert Pages
Warning	a and b	a and b
Table of Contents	i and ii	i and ii
	xi and xii	xi and xii
Task 1	1-19 and 1-20	1-19 and 1-20
Task 6	6-3 and 6-4	6-3 and 6-4
Task 8	8-5 thru 8-8.1/8-8.2	8-5 thru 8-8.1/8-8.2
	8-17 and 8-18	8-17 and 8-18
Task 13	13-3 thru 13-6	13-3 thru 13-6
	13-7 and 13-8	13-7 and 13-8
Task 14	14-17 and 14-18	14-17 and 14-18

	Remove Pages	Insert Pages
Task 20	20-3 and 20-4	20-3 and 20-4
	20-45 thru 20-50	20-45 thru 20-50
Task 22	22-1 and 22-2	22-1 and 22-2
	22-7 and 22-8	22-7/22-8

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URGENT

NOTICE: Change 12 is being printed prior to Change 11 because of priority. Change 11 will be forthcoming. TM changes must be inserted in numerical sequence.

TM 55-1520-237-23-6
TO 1H-60(U)A-2-6
C 12

CHANGE
NO. 12

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 27 December 1982

Aviation Unit and Intermediate Maintenance
POWERPLANT, FUEL, AND RELATED SYSTEMS
MAINTENANCE TASK MANUAL

UH-60A HELICOPTER

TM 55-1520-237-23-6, 29 December 1978, is changed as follows:

1. This change establishes TM 55-1520-237-23-6 as Air Force TO 1H-60(U)A-2-6.

2. Remove and insert pages as indicated below.

	Remove pages	Insert pages
Task 2	2-5 thru 2-6.1/2-6.2 2-7 and 2-8	2-5 thru 2-6.2 2-7 and 2-8

URGENT

3. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

4. Retain these sheets in front of manual for reference purposes.

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TM 55-1520-237-23-6
TO 1H-60(U)A-2-6
C 11

CHANGE

NO. 11

HEADQUARTERS
DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 15 October 1982

Aviation Unit and Intermediate Maintenance

POWERPLANT, FUEL, AND RELATED SYSTEMS MAINTENANCE TASK MANUAL

UH-60A HELICOPTER

TM 55-1520-237-23-6, 29 December 1978, is changed as follows:

1. This change establishes TM 55-1520-237-23-6 as Air Force TO 1H-60(U)A-2-6.

2. Remove and insert pages as indicated below.

	Remove pages	Insert pages
Table of Contents	v thru viii	v thru viii.1/viii.2
	xi/xii	xi/xii
Task 1	1-1 and 1-2	1-1 and 1-2
	1-3 and 1-4	1-3 and 1-4
	1-9 and 1-10	1-9 and 1-10
	1-13 thru 1-16	1-13 thru 1-16
	1-19 and 1-20	1-19 and 1-20
	1-21 and 1-22	1-21 thru 1-23/1-24

	Remove pages	Insert pages
Task 4	4-1 and 4-2	4-1 and 4-2
	4-4.1/4-4.2	4-4.1/4-4.2
	4-15 and 4-16	4-15 and 4-16
Task 7	7-1 and 7-2	7-1 thru 7-2.1/7-2.2
	7-3 and 7-4	7-3 thru 7-4.1/7-4.2
	7-5 and 7-6	7-5 thru 7-6.1/7-6.2
Task 8	8-3 and 8-4	8-3 and 8-4
	8-7 and 8-8	8-7 thru 8-8.1/8-8.2
	8-9 thru 8-10.1/8-10.2	8-9 thru 8-10.1/8-10.2
	8-11 thru 8-12.1/8-12.2	8-11 thru 8-12.1/8-12.2
	8-13 thru 8-14.1/8-14.2	8-13 thru 8-14.1/8-14.2
	8-16.1/8-16.2	8-16.1/8-16.2
Task 10	---	10-2.1/10-2.2
	10-3 and 10-4	10-3 and 10-4
	---	10-6.1/10-6.2
	10-7 and 10-8	10-7 and 10-8
Task 13	13-1 thru 13-6	13-1 thru 13-6
	13-7 and 13-8	13-7 thru 13-8.1/13-8.2
	13-9 and 13-10	13-9 and 13-10
	13-25/13-26	13-25 thru 13-36
Task 15	15-1 and 15-2	15-1 and 15-2
	---	15-4.1/15-4.2
	15-5 thru 15-8	15-5 thru 15-8
	15-17 thru 15-20	15-17 thru 15-20
Task 20	20-1 and 20	20-1 and 20-2

	Remove pages	Insert pages
Task 22	22-1 and 22-2	22-1 and 22-2
	22-5 thru 22-7/22-8	22-5 thru 22-8
Task 24	---	24-1 thru 24-5/24-6

3. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

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URGENT

NOTICE: Change 10 is being printed prior to Change 9 because of priority. Change 9 will be forthcoming. TM changes must be inserted in numerical sequence.

TM 55-1520-237-23-6
C 10

CHANGE
No. 10

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *11 August 1982*

Aviation Unit and Intermediate Maintenance POWERPLANT, FUEL, AND RELATED SYSTEMS MAINTENANCE TASK MANUAL

UH-60A HELICOPTER

TM 55-1520-237-23-6, 29 December 1978, is changed as follows:

1. Remove and insert pages as indicated below.

	Remove pages	Insert pages
Task 10	10-3 thru 10-6	10-3 thru 10-6

2. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

URGENT

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TM 55-1520-237-23-6
C 9

CHANGE }
No. 9 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 4 August 1982

Aviation Unit and Intermediate Maintenance POWERPLANT, FUEL, AND RELATED SYSTEMS MAINTENANCE TASK MANUAL

UH-60A HELICOPTER

TM 55-1520-237-23-6, 29 December 1978, is changed as follows:

1. Remove and insert pages as indicated below.

	Remove pages	Insert pages
Task 1	1-1 thru 1-2.2	1-1 thru 1-2.2
Task 2	2-9/2-10	2-9 and 2-10
Task 4	4-1 and 4-2	4-1 and 4-2
Task 8	-	8-6.1/8-6.2
	8-9 and 8-10	8-9 and 8-10
	-	8-12.1/8-12.2
	8-13 and 8-14	8-13 and 8-14
	8-15 and 8-16	8-15 thru 8-16.1/8-16.2
Task 9	9-1 thru 9-4	9-1 thru 9-5/9-6
Task 10	10-11 thru 10-14	10-11 thru 10-14
Task 14	14-3 and 14-4	14-3 and 14-4
	14-33 and 14-34	14-33 and 14-34
Task 19	19-1 thru 19-4	19-1 thru 19-4
	19-6.1/19-6.2	19-6.1/19-6.2

2. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

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CHANGE }
No. 8 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 2 March 1982

Aviation Unit and Intermediate Maintenance

POWERPLANT, FUEL, AND RELATED SYSTEMS MAINTENANCE TASK MANUAL UH-60A HELICOPTER

TM 55-1520-237-23-6, 29 December 1978, is changed as follows:

1. Remove and insert pages as indicated below.

	Remove Pages	Insert Pages
Introduction	iii and iv	iii and iv
	---	iv.1/iv.2
Task 1	1-3 and 1-4	1-3 and 1-4
	1-7 and 1-8	1-7 and 1-8
	1-13 and 1-14	1-13 and 1-14
	1-19 and 1-20	1-19 and 1-20
	---	1-20.1/1-20.2
	1-21 and 1-22	1-21 and 1-22
Task 2	2-6.1/2-6.2 thru 2-8	2-6.1/2-6.2 thru 2-8
Task 3	3-1 thru 3-4	3-1 thru 3-4
Task 4	4-2.1/4-2.2	4-2.1/4-2.2
	4-9 and 4-10	4-9 and 4-10
	4-15 and 4-16	4-15 and 4-16

	Remove Pages	Insert Pages
Task 8	8-5 thru 8-8	8-5 thru 8-8
Task 15	15-21 and 15-22	15-21 and 15-22
Task 19	19-1 thru 19-6	19-1 thru 19-6
	---	19-6.1/19-6.2
	19-9 thru 19-14	19-9 thru 19-14

2. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

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CHANGE
No. 7

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 14 August 1981

Aviation Unit and Intermediate Maintenance
POWERPLANT, FUEL, AND RELATED SYSTEMS
MAINTENANCE TASK MANUAL

UH-60A HELICOPTER

TM 55-1520-237-23-6, 29 December 1978, is changed as follows:

1. Remove and insert pages as indicated below.

	Remove pages	Insert pages
List of Effective Pages	A thru E/F	---
Warning Page	a and b	a and b
Table of Contents	v and vi	v and vi
Task 1	1-15 and 1-16	1-15 and 1-16
Task 2	2-1 and 2-2	2-1 and 2-2
	2-5 thru 2-9/2-10	2-5 thru 2-9/2-10
Task 4	4-3 thru 4-4.1/4-4.2	4-3 thru 4-4.1/4-4.2
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Task 10	10-3 thru 10-6	10-3 thru 10-6

	Remove pages	Insert pages
Task 13	13-15 and 13-16	13-15 and 13-16
Task 15	15-19 and 15-20	15-19 and 15-20
Task 20	20-31 and 20-32	20-31 and 20-32

2. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

3. Retain these sheets in front of manual for reference purposes.

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

ROBERT M. JOYCE
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, Organizational Maintenance Requirements for UH-60A aircraft.

WARNING

Personnel performing operations, procedures, and practices which are included or implied in this technical manual shall observe the following warnings. Disregard of these warnings and precautionary information can cause serious injury, death, or an aborted mission.

CONSUMABLE MATERIALS

Observe all cautions and warnings on the containers when using consumables. When applicable wear necessary protective gear during handling and use. If a consumable is flammable or explosive, *MAKE CERTAIN* consumable and its vapors are kept away from heat, spark, and flame. *MAKE CERTAIN* helicopter is properly grounded and fire fighting equipment is readily available prior to use (TM 55-1500-204-25/1).

ELECTRICAL GROUNDING OF THE HELICOPTER

Army regulations require the grounding of the helicopter when doing all fueling and defueling operations. Do not operate any helicopter electrical switches except those essential for servicing during fueling and defueling. Do not smoke or use flame during fueling and defueling operations.

HIGH VOLTAGE

There are dangerous voltages in the helicopter. Use extreme care when working with equipment having these voltages.

USE OF FIRE EXTINGUISHERS

When fire extinguishers are used in a confined area, ventilate immediately. Serious injury or death could result if the area is not ventilated or the user does not use a self-contained breathing device.

CARBON MONOXIDE

During cold weather operations when preheating is necessary, all personnel should become acquainted with the various types of heaters and where they are to be used. Be careful of accumulations of carbon monoxide and damage to heat-sensitive equipment.

HYDRAULIC SYSTEMS

There are dangerously high hydraulic system pressures in the helicopter. Use extreme care when working on systems having this pressure.

AC POWER

Before applying ac power to the helicopter, make certain that the area around the stabilator is clear of personnel and equipment. Should the stabilator be in any position other than trailing edge full down, it will reposition automatically to full down when ac power is applied.

MAIN ROTOR PYLON SLIDING COVER

When opening and closing main rotor pylon sliding cover, keep hands away from sharp edges near track, mating end, and especially ventilation blower inlet hole. Make certain that while closing the cover assembly, the forward rollers are seated in their tracks. After the cover assembly is locked with the locking latches, lift both right and left sides of the forward portion of the cover to assure the alignment/retaining pins are seated.

Warnings, cautions, and notes are used to emphasize important and critical instructions and are used for the following conditions:

WARNING

An operating procedure, practice, etc., which, if not correctly followed, could result in personal injury or loss of life.

CAUTION

An operating procedure, practice, etc., which, if not strictly observed, could result in damage to or destruction of equipment.

NOTE

An operating procedure, condition, etc., which it is essential to highlight.

Introduction

This **Maintenance Task Manual** contains information for the maintenance specialists to do specific maintenance tasks. The manual is individual, self-contained, and task-oriented for MOS 68B. It covers removal, installation, repair, and adjustment instructions written simply. Refer to Army Regulations and Operator's Manual for personnel requirements and procedures for ground run and flight checking the helicopter.

All the requirements for doing each task are listed at the beginning of the tasks under the headings **PERSONNEL REQUIRED, SUPPLIES, TOOLS,** and items **ALSO NEEDED**.

PERSONNEL REQUIRED requirements give the recommended MOSs needed. Through cross-training, individuals with different MOSs may be qualified to do a specific task.

Acceptance/Rejection information in text, such as wear limits, fits, tolerances, and torque values, is indicated by **boldface** type. This type highlights the information.

This manual is one of a set of 13 separate manuals that cover maintenance instructions for the model UH-60A helicopters. The 13 manuals are:

Introduction (Cont)

Wiring Data Manual	TM 55-1520-237-23-1
Aircraft General Information Manual	TM 55-1520-237-23-2
Aircraft Fault Isolation Procedures Manual	TM 55-1520-237-23-3
Maintenance Task Manual, Servicing, Ground Handling, Air Transportability, and General Maintenance	TM 55-1520-237-23-4
Maintenance Task Manual, Airframe and Landing Gear	TM 55-1520-237-23-5
Maintenance Task Manual, Powerplant, Fuel, and Related Systems	TM 55-1520-237-23-6
Maintenance Task Manual, Powertrain	TM 55-1520-237-23-7
Maintenance Task Manual, Hydraulics and Flight Controls	TM 55-1520-237-23-8
Maintenance Task Manual, Electrical and Instruments	TM 55-1520-237-23-9
Maintenance Task Manual, Structural Repair	TM 55-1520-237-23-10
Avionics General Information Manual	TM 11-1520-237-23-1
Avionics Fault Isolation Procedures Manual	TM 11-1520-237-23-2
Maintenance Task Manual, Avionics	TM 11-1520-237-23-3

These manuals contain maintenance data through the Aviation Intermediate Maintenance (AVIM) support level. They do not have depot level maintenance instructions.

The **Wiring Data Manual,** TM 55-1520-237-23-1, has wire lists and general wiring repair instructions for the entire helicopter.

The **General Information Manuals,** TM 55-1520-237-23-2 and TM 11-1520-237-23-1, contain descriptions and theories of operation of helicopter systems and major components. The Aircraft General Information Manual covers the entire helicopter, except for avionics systems. The Avionics General Information Manual covers only avionics.

Introduction (Cont)

The **Task Manuals** TM 55-1520-237-23-4 through -10 and TM 11-1520-237-23-3, have information needed for the maintenance specialist to do specific maintenance tasks. The manuals are individual, self-contained, and task-oriented. A separate manual covers each MOS, except for the helicopter repairman, MOS 67T. He has maintenance tasks in each manual and therefore needs a complete set of Task Manuals.

The **Fault Isolation Procedures Manuals,** TM 55-1520-237-23-3 and TM 11-1520-237-23-2, have data for troubleshooting the helicopter's systems. Operational checkout procedures and logic-type troubleshooting charts give detailed step-by-step instructions to identify malfunctioning components. Component location diagrams and schematics are also included. The Aircraft Fault Isolation Procedures Manual covers all helicopter systems except for avionics. The Avionics Fault Isolation Procedures Manual covers only avionics.

USING BATTERY POWER DURING MAINTENANCE

CAUTION

Use battery power as little as possible when maintaining the helicopter. If the battery charge gets too low the APU will not start when only battery electrical power is available. To prevent running down the battery:

-Make sure BAT switch is ON when ac power (either external power applied, or APU or main generator operating) is supplied to helicopter. This allows battery to charge if necessary.

-Make sure BAT switch is OFF when ac power is not applied to helicopter and battery is not being used.

-Make sure maintenance and cockpit utility lights are off when not in use.

-If a BATT LOW CHARGE caution indication is obtained while using battery power, then immediately place BAT switch OFF.

Introduction (Cont)

COLD WEATHER—BATTERY MAINTENANCE

CAUTION

To prevent damage to the battery, refer to TM 11-6140-203-14-2.

FLASHING MASTER WARNING PANEL CAPSULE

CAUTION

If it is desired to turn off the flashing master warning panel LOW ROTOR RPM capsule while doing maintenance, pull out the pilot's circuit breaker panel NO. 2 DC INST circuit breaker. The repeated maintenance practice of pushing on the LOW ROTOR RPM capsule to disable it, will damage it.

Introduction (Cont)

PROPER MATING OF M83723/95 OR M83723/96 CONNECTORS

NOTE

When mating M83723/95 or M83723/96 connectors (those having cutout at either side of connector coupling ring, with adjacent orange strips), follow these instructions:

- Tighten connector until thick metal tab is lined up with or slightly past orange strips. Tab moves toward grommet end of connector as connector is tightened.
- Do not use blue line on receptacle as an indication that connector is mated.
- If connector cutout is not easily visible due to its location, handtighten connector.

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REQUEST FOR ENGINEERING AUTHORIZATION. All requests for engineering authorization, when required by this manual, will be forwarded to U.S. Army Aviation Systems Command ATTN: AMSAV-ME, 4300 Goodfellow Boulevard, St. Louis, Missouri 63120-1798. Urgent requests shall include detailed information on the problem, e.g., sketches, photographs, dimensional data, etc., to assist in evaluation and prompt reply.

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS. You can help improve this manual. If you find any mistake or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of TM 55-1520-237-23-2, direct to Commander, U.S. Army Aviation Systems Command, ATTN: AMSAV-MPSD, 4300 Goodfellow Boulevard, St. Louis, Missouri 63120-1798. A reply will be furnished to you.

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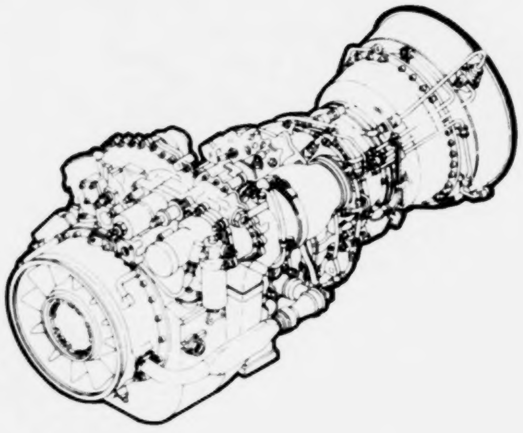
TASK 1

ENGINE - REMOVE, INSTALL

- **REMOVE AIR INLET AND DISCONNECT ENGINE/AIRFRAME CONNECTIONS - STEP 1**
- **ATTACH LIFTING SLING - STEP 2**
- **DISCONNECT ENGINE MOUNTS - STEP 3**
- **REMOVE ENGINE - STEP 4**
- **INSTALL REPLACEMENT ENGINE - STEP 5**
- **CONNECT ENGINE MOUNTS - STEP 6**
- **CONNECT ENGINE/AIRFRAME CONNECTIONS - STEP 7**
- **INSTALL AIR INLET - STEP 8**
- **STEP 9 - DELETED**



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PERSONNEL REQUIRED

- Two People Required: MOS 68B - Aircraft Powerplant Repairer
  MOS 67T - Tactical Transport Helicopter Repairer

SUPPLIES

- Anti-Seize Compound, MIL-A-907 (STEP 7)
- Cotter Pin, MS24665-302 (3 Required, STEP 6)
- Cotter Pin, MS24665-304 (2 Required, STEP 5)
- Coupling, 710043-1.25-11 (FSCM 70628) (2 Required, STEP 7)
  (1 Required, STEP 8)
- Lubricating Oil, MIL-L-23699 (STEP 7)
- Packing, MS29513-211 (1 Required, STEP 7)
- Petrolatum, Fed. Spec VV-P-236 (STEPS 7, 8)

TOOLS

- Abrasive Cloth, Fed. Spec P-C-451 (STEP 6)
- Adapter, 21C7082 (FSCM 07482) (STEPS 4, 5)
- Aircraft Mechanic's Toolkit, NSN 5180-00-323-4692
- Crocus Cloth, Fed. Spec P-C-458 (STEP 6)
- Engine and Powertrain Repairman's Toolkit, NSN 5180-00-323-4944
- Hoist, to Support Weight of Engine (STEPS 2, 5)
- Lifting Sling, 21C7081G02 (FSCM 99207) (STEPS 2, 5)
- Maintenance Crane, 70700-20300-042 (Alternate For Hoist) (STEP 1)
- Torque Wrench, 150 - 750 inch-pounds, NSN 5120-00-821-3441 (STEP 6)
- Torque Wrench, 30 - 150 inch-pounds, NSN 5120-00-542-4489 (STEPS 6, 7, 8)

ALSO NEEDED
- Protective Caps (STEP 1)
- TASK 2 (STEPS 6, 8)
- TASK 4 (STEP 4)
- TM 55-1500-204-25/1 (STEP 8)
- TM 55-1520-237-MTF (STEP 8)
- TM 55-1520-237-23-4 (STEP 3)
- TM 55-1520-237-23-5 (STEPS 7, 8)
- TM 55-1520-237-23-7 (STEPS 3, 6)
- TM 55-2840-248-23 (STEPS 1, 4, 6, 8)

STEP 1 REMOVE AIR INLET AND DISCONNECT ENGINE/AIRFRAME CONNECTIONS

NOTE

- The following procedures apply to both No. 1 and No. 2 engines.
- Preserve engine before removal (TM 55-2840-248-23).

- If maintenance crane, 70700-20300-042, will be used, assemble and set up crane (TM 55-1520-237-23-4).

REMOVE AIR INLET

- Turn off all electrical power.

STEP 1 REMOVE AIR INLET AND DISCONNECT ENGINE/AIRFRAME CONNECTIONS (CONT)

- Open engine cowling.
- Disconnect electrical harness from air inlet receptacle. Cap receptacle.
- Remove coupling holding bleed-air tube to air inlet. Inspect coupling for cracks, tears, hardening, or other damage. Replace coupling, if damaged.
- Disconnect fire extinguishing tube clamped to air inlet from fitting on firewall. Loosen clamp to slide tube to clear firewall when removing inlet.
- If deicing kit is installed on right inlet, disconnect ice detector wiring harness from receptacle on firewall.
- Unclamp waterwash hose from air inlet scoop.
- Loosen both coupling nuts equally and disconnect coupling holding air inlet to engine swirl frame. Remove screws and bolt holding fairing beneath air inlet, to allow it to be moved away from air inlet. Slide inlet frontward and remove from helicopter.

DISCONNECT ENGINE/AIRFRAME CONNECTIONS

- Disconnect fuel hose at fuel pump elbow. Cap hose and elbow.
- Disconnect engine drain hoses from elbows on rear engine compartment deck.
- Remove clamps holding common drain to engine compartment shield at station 381.40.
- On No. 1 engine only, remove clamp holding swirl frame drain to airframe at station 371.80.

NOTE

Common drains and swirl frame drains are clamped only on helicopters Serial No. 77-22727, 77-22728, and 78-22963 and subsequent.

- Cap tubes, hoses, and elbows.
- Disconnect electrical harnesses from firewall receptacles. Cap receptacles.

STEP 1 REMOVE AIR INLET AND DISCONNECT ENGINE/AIRFRAME CONNECTIONS (CONT)

- Disconnect engine controls from engine.
- Remove bleed-air line from starter and firewall.
- Keep bleed-air line and attaching hardware with helicopter.
- Remove and discard coupling holding cross bleed-air tube at firewall. Keep clamps for future use.
- On No. 2 engine only, unclamp engine control cables from inlet particle separator (IPS) duct Disconnect coupling and remove inlet particle separator (IPS) duct from IPS blower.
- Unclamp deswirl duct from engine and place duct and coupling inside of fairing.

NOTE - Deleted

STEP 1 REMOVE AIR INLET AND DISCONNECT ENGINE/AIRFRAME CONNECTIONS (CONT)

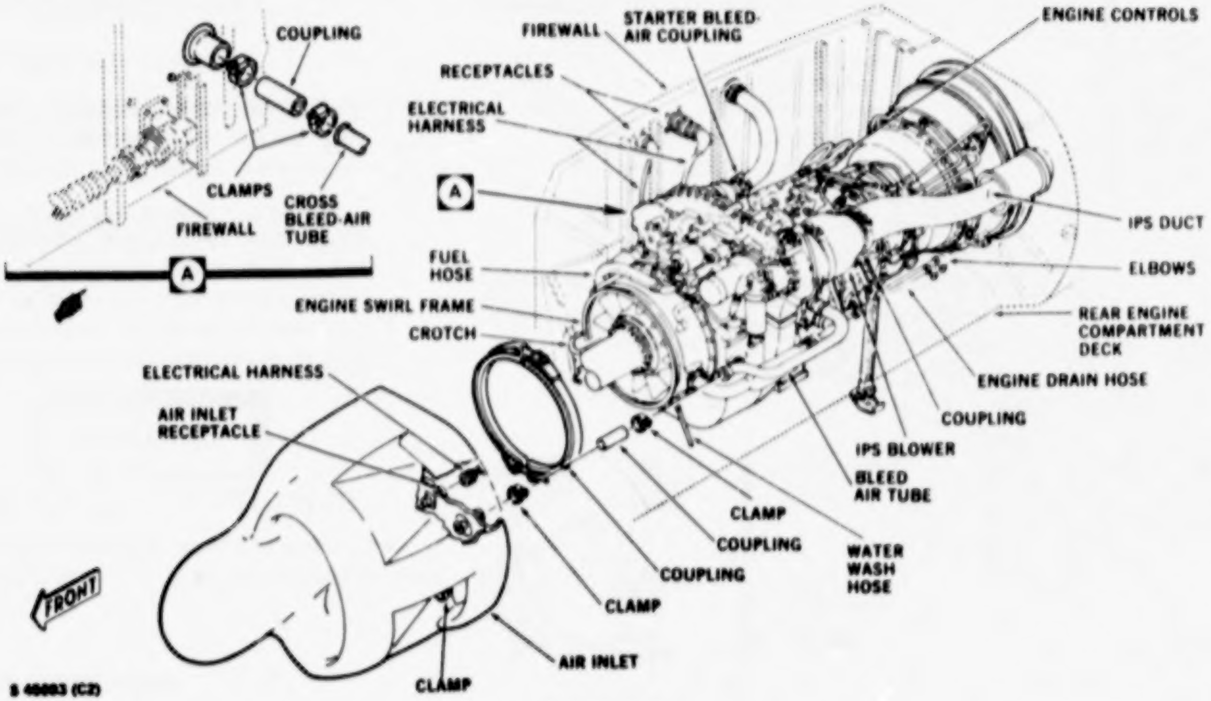
COUPLING
CLAMPS
CROSS BLEED-AIR TUBE
FIREWALL
A
FIREWALL
STARTER BLEED-AIR COUPLING
ENGINE CONTROLS
RECEPTACLES
ELECTRICAL HARNESS
A
IPS DUCT
FUEL HOSE
ELBOWS
ENGINE SWIRL FRAME
REAR ENGINE COMPARTMENT DECK
CROTCH
ENGINE DRAIN HOSE
ELECTRICAL HARNESS
COUPLING
AIR INLET RECEPTACLE
IPS BLOWER
BLEED AIR TUBE
CLAMP
COUPLING
WATER WASH HOSE
COUPLING
CLAMP
FRONT
AIR INLET
CLAMP
S 40003 (C2)

Figure 1-1

STEP 2 ATTACH LIFTING SLING

ATTACHMENT

- Install lifting sling, 21C7081G02, on engine front and rear lifting lugs with quick-disconnect pins.
- Pin lifting eye in No. 3 hole on lifting sling.

WARNING

To prevent injury to personnel or damage to equipment, do not use crane as a source of excessive force to free engine from helicopter. Make sure crane hook does not touch pulley when lifting engine, as this may damage the cable.

- Attach sling to maintenance crane or to a hoist with enough capacity to lift engine. Raise hoist until weight of engine is supported by sling.

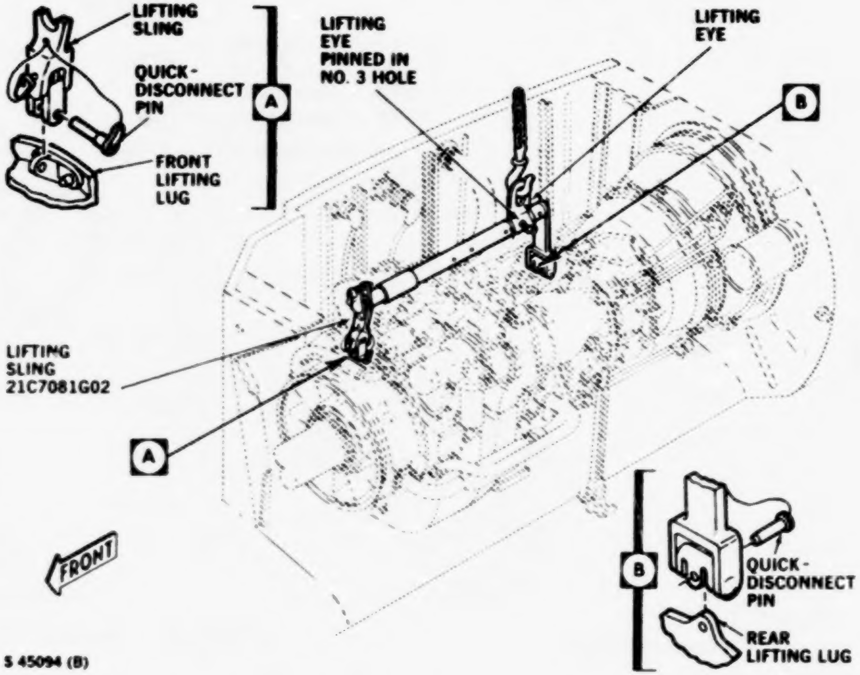
LIFTING SLING
QUICK-DISCONNECT PIN
FRONT LIFTING LUG
A
LIFTING EYE PINNED IN NO. 3 HOLE
LIFTING EYE
B
LIFTING SLING 21C7081G02
A
FRONT
B
QUICK-DISCONNECT PIN
REAR LIFTING LUG

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Figure 1-2

STEP 3 DISCONNECT ENGINE MOUNTS

DISCONNECT FORWARD MOUNT

- Hold input drive shaft with hand. Unbolt flexible coupling from gear box input module.

- Unbolt forward engine support from gimbal.

NOTE

Replace any broken bolts on -102 gimbal per TM 55-1520-237-23-7.

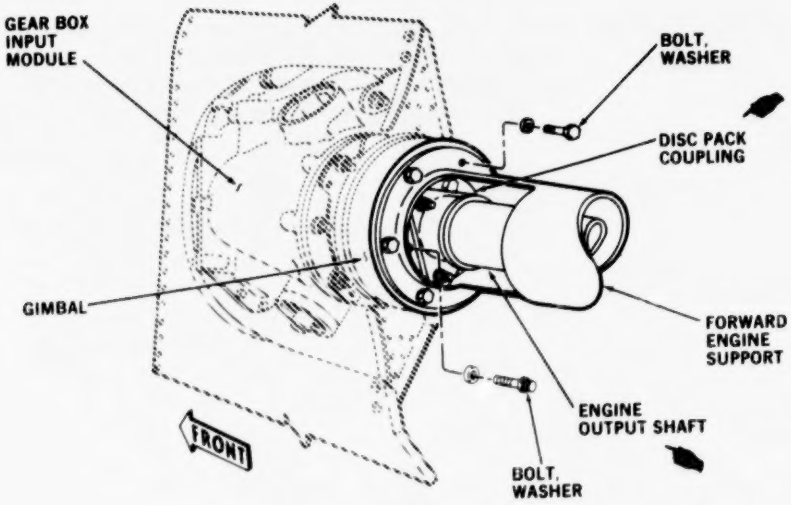
- Keep bolts and washers with gimbal for installing engine.

CAUTION

If any bolts or washers used to connect flexible coupling to gear box input module are being replaced, replace all bolts and washers with hardware kit 70000-10100-042 or 70000-10100-042. If kit is not available, bolts and washers are to be selected in sets of three so that difference in weight between individual bolt or between individual washers per set is not over 0.0250 grams.

STEP 3 DISCONNECT ENGINE MOUNTS (CONT)

- Perform engine output shaft inspection after disconnect (TM 55-1520-237-23-4).


GEAR BOX INPUT MODULE
BOLT, WASHER
DISC PACK COUPLING
GIMBAL
FORWARD ENGINE SUPPORT
ENGINE OUTPUT SHAFT
BOLT, WASHER
FRONT

S 45095.1 (C22)

Figure 1-3 (Sheet 1 of 2)

STEP 3 DISCONNECT ENGINE MOUNTS (CONT)

DISCONNECT REAR MOUNTS

- Unbolt inner and outer mount struts from mount links.

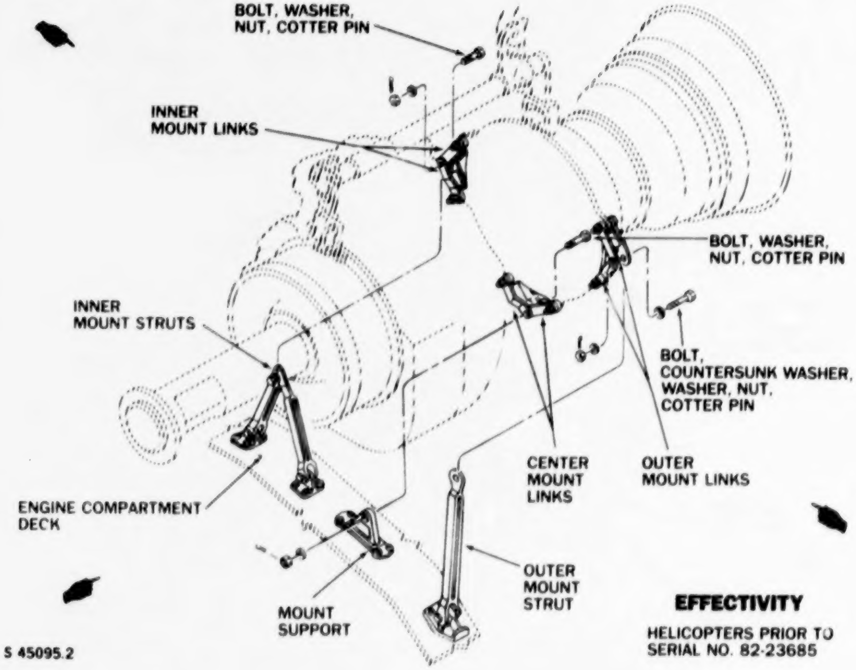
NOTE

Keep attaching hardware and shim washers with strut.

- Unbolt mount links from mount support under engine combustor section on engine compartment deck.

NOTE

Keep attaching hardware and shim washers with mount support.


BOLT, WASHER, NUT, COTTER PIN
INNER MOUNT LINKS
BOLT, WASHER, NUT, COTTER PIN
INNER MOUNT STRUTS
BOLT, COUNTERSUNK WASHER, WASHER, NUT, COTTER PIN
CENTER MOUNT LINKS
OUTER MOUNT LINKS
ENGINE COMPARTMENT DECK
OUTER MOUNT STRUT
MOUNT SUPPORT
S 45095.2

EFFECTIVITY

HELICOPTERS PRIOR TO SERIAL NO. 82-23685

Figure 1-3 (Sheet 2 of 2)

STEP 5 INSTALL REPLACEMENT ENGINE (CONT)

NOTE

Make sure all bolts are installed in the same direction.

- Shim with AN960C816 washers, if required, to install cotter pin when connecting center mount links to mounting flange.
- Bolt center mount links to engine with bolts, countersunk washers, washers, and nuts. Make sure countersunk side of washers face bolthead. **TIGHTEN EACH NUT FINGERTIGHT, ADVANCE NUT TO NEXT SLOT**. Install cotter pin, MS24665-304.
- Raise and place engine in engine compartment.

STEP 6 CONNECT ENGINE MOUNTS

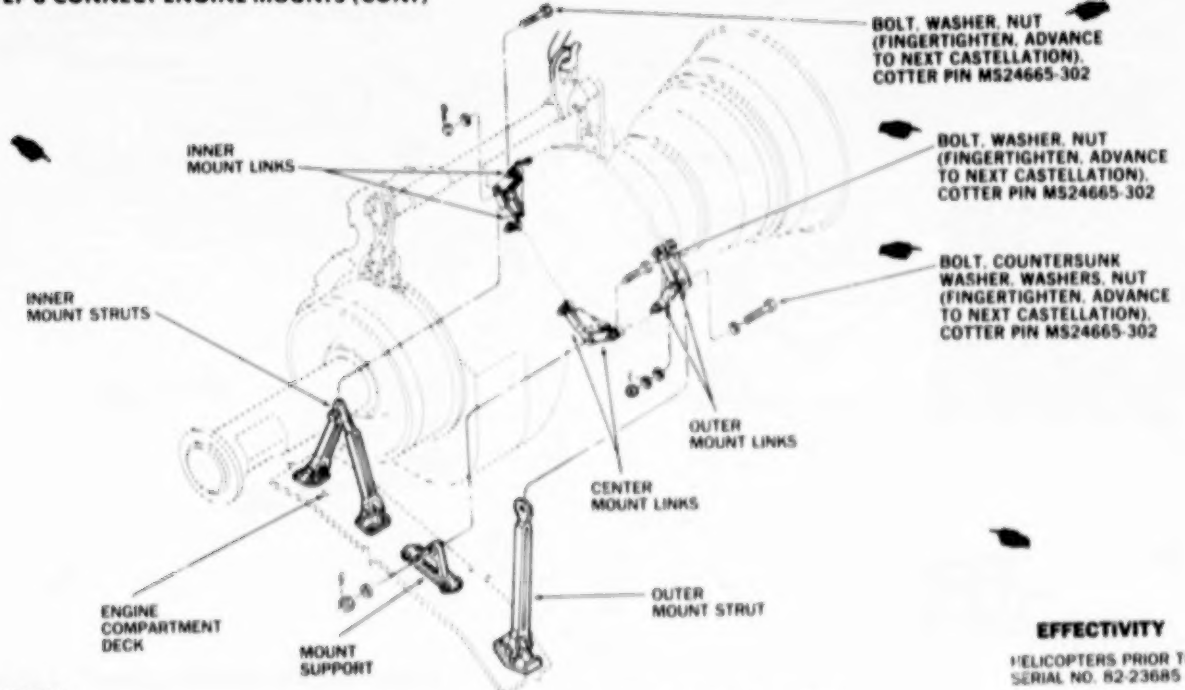
CONNECT REAR MOUNTS

- On helicopters prior to serial No. 82-23685, do this:
  - Bolt inner and outer mount struts to mount links with bolts, washers, and nuts. **TIGHTEN NUTS FINGERTIGHT, ADVANCE TO NEXT CASTELLATION.** Install cotter pins, MS24665-302.
  - Bolt center mount links to mount support with bolts, washers, and nuts. **TIGHTEN NUT FINGERTIGHT, ADVANCE TO NEXT CASTELLATION.** Install cotter pin, MS24665-302.
  - If shimming is required to allow cotter pin to be inserted in nut properly when connecting mount links to mount struts or support, use AN960C616 or AN960C616L washers, under bolthead or nut.
- On helicopters serial Nos 82-23685 and subsequent, do this:
  - Bolt inner and outer mount struts to mount links with bolts, washers, and nuts. **TORQUE NUTS TO 181 - 199 INCH-POUNDS.** Install cotter pins, MS24665-302.
  - Deleted
  - Bolt center mount links to mount support with bolt, countersunk washer, washer, and nut. **TIGHTEN NUT UNTIL FIRMLY SEATED, THEN BACK OFF UNTIL WASHER UNDER NUT CAN BE TURNED BY HAND. RETIGHTEN NUT JUST ENOUGH SO THAT WASHER CAN NOT BE TURNED BY HAND. TIGHTEN NUT TO NEXT CASTELLATION.** Install cotter pin, MS24665-302. Do not tighten nut more than one castellation. Shim, if required, to install cotter pin.

CONNECT FORWARD MOUNT

- Slide input drive shaft into engine and support tube as far as it will go.

STEP 6 CONNECT ENGINE MOUNTS (CONT)

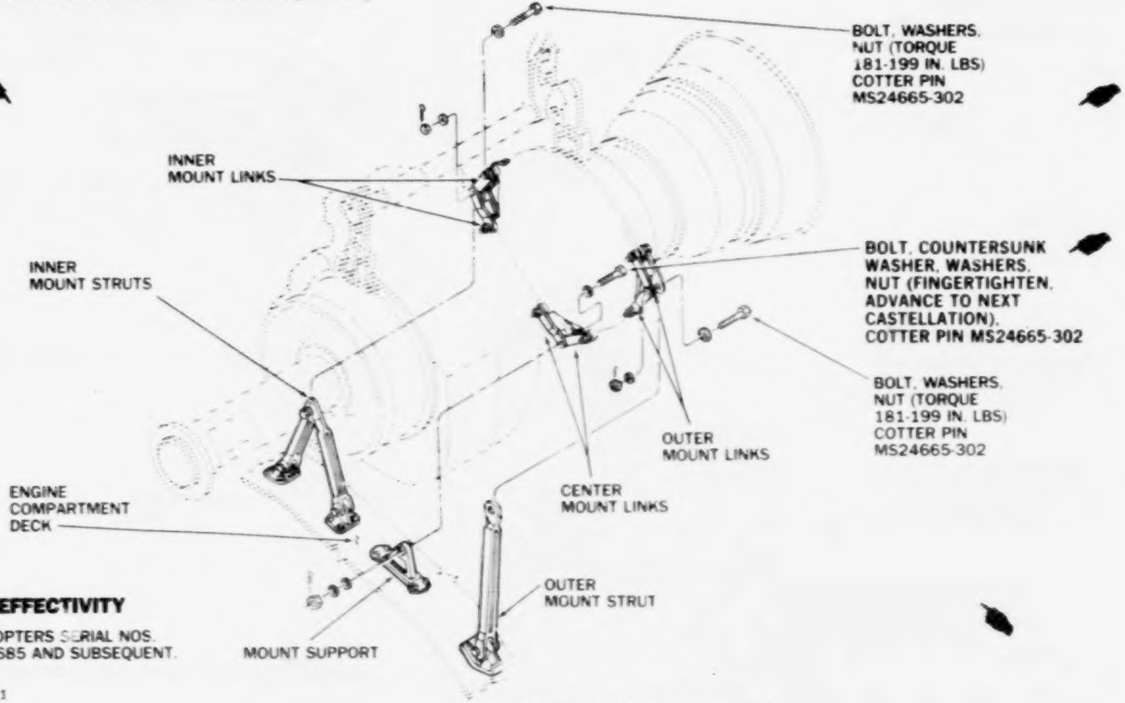

BOLT, WASHER, NUT (FINGERTIGHTEN, ADVANCE TO NEXT CASTELLATION), COTTER PIN MS24665-302
INNER MOUNT LINKS
BOLT, WASHER, NUT (FINGERTIGHTEN, ADVANCE TO NEXT CASTELLATION), COTTER PIN MS24665-302
BOLT, COUNTERSUNK WASHER, WASHERS, NUT (FINGERTIGHTEN, ADVANCE TO NEXT CASTELLATION), COTTER PIN MS24665-302
INNER MOUNT STRUTS
OUTER MOUNT LINKS
CENTER MOUNT LINKS
OUTER MOUNT STRUT
ENGINE COMPARTMENT DECK
MOUNT SUPPORT
S 45098.1

EFFECTIVITY

HELICOPTERS PRIOR TO SERIAL NO. 82-23685

Figure 1-6 (Sheet 1 of 2)

STEP 6 CONNECT ENGINE MOUNTS (CONT)


BOLT, WASHERS, NUT (TORQUE 181-199 IN. LBS) COTTER PIN MS24665-302
INNER MOUNT LINKS
BOLT, COUNTERSUNK WASHER, WASHERS, NUT (FINGERTIGHTEN, ADVANCE TO NEXT CASTELLATION), COTTER PIN MS24665-302
INNER MOUNT STRUTS
BOLT, WASHERS, NUT (TORQUE 181-199 IN. LBS) COTTER PIN MS24665-302
OUTER MOUNT LINKS
CENTER MOUNT LINKS
ENGINE COMPARTMENT DECK
OUTER MOUNT STRUT
MOUNT SUPPORT

EFFECTIVITY

HELICOPTERS SERIAL NOS.
82-23685 AND SUBSEQUENT.

S 45098.1.1

Figure 1-6 (Sheet 1.1 of 2)

STEP 4 REMOVE ENGINE

REMOVE

CAUTION

Do not allow engine to swing into helicopter or adapter.

STEP 4 REMOVE ENGINE (CONT)

- Raise engine high enough to clear engine cowling.
- Unbolt aft mount links from flange under engine combustor section. Keep links and attaching parts with demountable power package.
- Swing engine outward and lower it onto adapter, 21C7082G01.
- Bolt engine to adapter using instructions in TM 55-2840-248-23.
- Remove lifting sling from engine.
- If engine is being replaced, tear down demountable power package and install components on new engine (TASK 4).

NOTE

Be sure not to tear down demountable power package if you have quick engine change. See Task 4 for procedures.

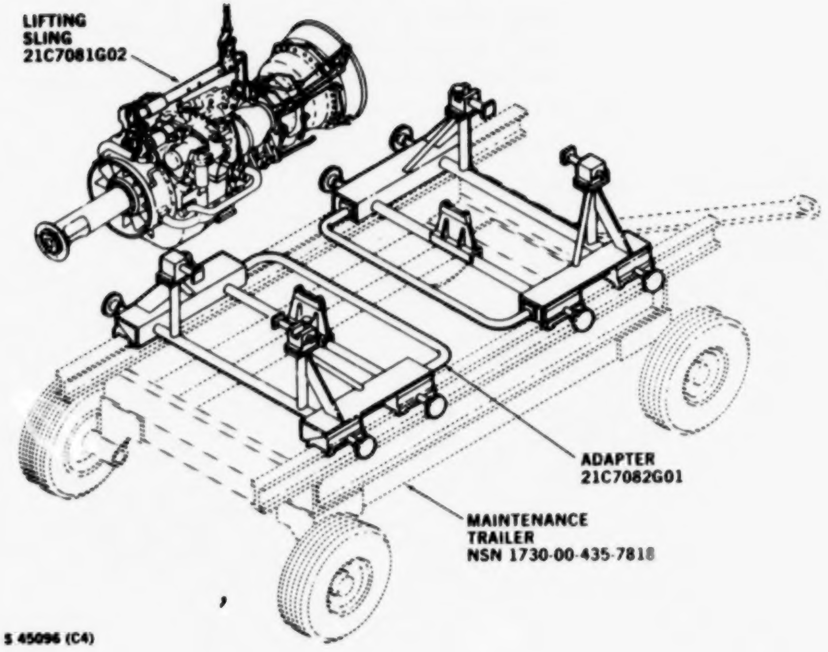

LIFTING SLING 21C7081G02
ADAPTER 21C7082G01
MAINTENANCE TRAILER NSN 1730-00-435-7818
S 45096 (C4)

Figure 1-4

STEP 5 INSTALL REPLACEMENT ENGINE

INSTALL

- Place deswirl duct and coupling inside of fairing before installing engine in compartment.

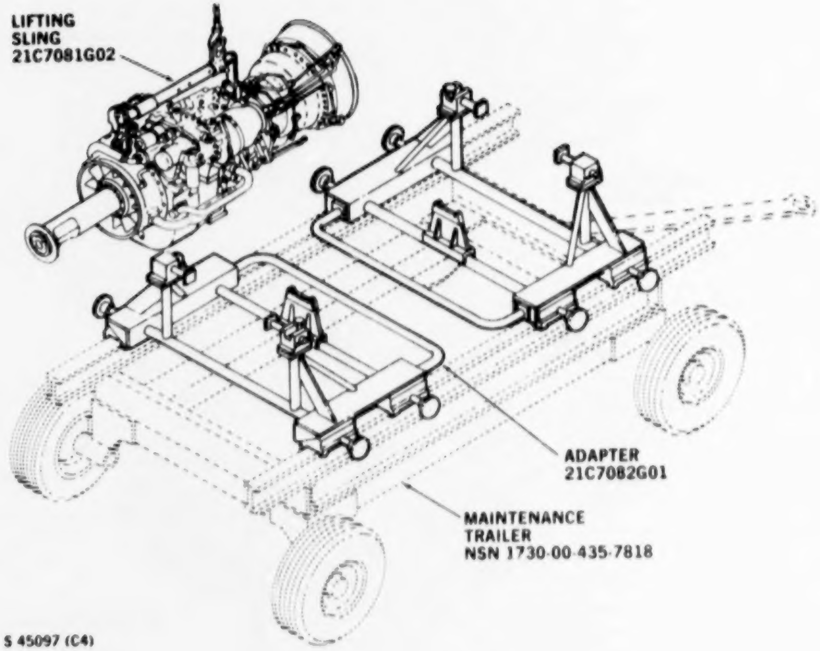
NOTE - Deleted

- If IPS duct was removed from No. 2 engine compartment, slide duct into exhaust fairing opening.
- Install lifting sling, 21C7081G02, on engine front and rear lifting lugs with quick-disconnect pins.
- Pin lifting eye in No. 3 hole on lifting sling.
- Attach hoist to sling. Raise hoist until weight of engine is supported by sling.

CAUTION

Do not allow engine to swing into helicopter or adapter.

- Unbolt engine from adapter.


LIFTING SLING 21C7081G02
ADAPTER 21C7082G01
MAINTENANCE TRAILER NSN 1730-00-435-7818

S 45097 (C4)

Figure 1-5

STEP 5 INSTALL REPLACEMENT ENGINE (CONT)

NOTE

Place shim washers, as required, under nuts to allow for different bolt lengths.

- Bolt aft mount links to mounting flange under combustor on bottom of engine with bolt heads toward rear of engine. **TIGHTEN EACH NUT FINGERTIGHT, ADVANCE NUT TO NEXT SLOT, AND INSTALL COTTER PIN, MS24665-304.**
- Raise and place engine in engine compartment.

STEP 6 CONNECT ENGINE MOUNTS

CONNECT AFT MOUNTS

NOTE

If shimming is required to allow cotter pin to be inserted in nut properly when connecting engine mount links to engine mount struts or support, use AN960C616 or AN960C616L washers, under bolthead or nut as required.

- On helicopters prior to serial No. 82-23685, do this:
  - Bolt inner and outer aft engine mount struts to engine mount links. **TIGHTEN NUTS FINGERTIGHT, ADVANCE TO NEXT SLOT, AND INSTALL COTTER PINS, MS24665-302.**
  - Bolt aft engine mount links to aft engine mount support under combustor section on engine compartment deck. **TIGHTEN NUT FINGERTIGHT, ADVANCE TO NEXT SLOT, AND INSTALL COTTER PIN, MS24665-302.**
- On helicopters serial Nos 82-23685 and subsequent, do this (Figure 1-6, Sheet 1.1):
  - Bolt inner and outer aft engine mount struts to engine mount links with bolts, countersunk washers, washers, and nuts. Make sure countersunk side of washers faces bolthead. **TORQUE NUTS TO 181 - 199 INCH-POUNDS.** Install cotter pins, MS24665-302.
  - Bolt aft engine mount links to aft engine mount support under combustor section on engine compartment deck. **TIGHTEN NUT FINGERTIGHT, ADVANCE TO NEXT SLOT, AND INSTALL COTTER PIN, MS24665-302.**

CONNECT FORWARD MOUNT

- Slide input drive shaft into engine and support tube as far as it will go.

STEP 6 CONNECT ENGINE MOUNTS

CONNECT AFT MOUNTS

NOTE

If shimming is required to allow cotter pin to be inserted in nut properly when connecting engine mount links to engine mount struts or support, use AN960C616 or AN960C616L washers, under bolthead or nut as required.

- On helicopters prior to serial No. 82-23685, do this:
  - Bolt inner and outer aft engine mount struts to engine mount links. **TIGHTEN NUTS FINGERTIGHT, ADVANCE TO NEXT SLOT, AND INSTALL COTTER PINS, MS24665-302.**
  - Bolt aft engine mount links to aft engine mount support under combustor section on engine compartment deck. **TIGHTEN NUT FINGERTIGHT, ADVANCE TO NEXT SLOT, AND INSTALL COTTER PIN, MS24665-302.**
- On helicopters serial Nos 82-23685 and subsequent, do this (Figure 1-6, Sheet 1.1):
  - Bolt inner and outer aft engine mount struts to engine mount links with bolts, countersunk washers, washers, and nuts. Make sure countersunk side of washers faces bolthead. **TORQUE NUTS TO 181 - 199 INCH-POUNDS.** Install cotter pins, MS24665-302.
  - Bolt aft engine mount links to aft engine mount support under combustor section on engine compartment deck. **TIGHTEN NUT FINGERTIGHT, ADVANCE TO NEXT SLOT, AND INSTALL COTTER PIN, MS24665-302.**

CONNECT FORWARD MOUNT

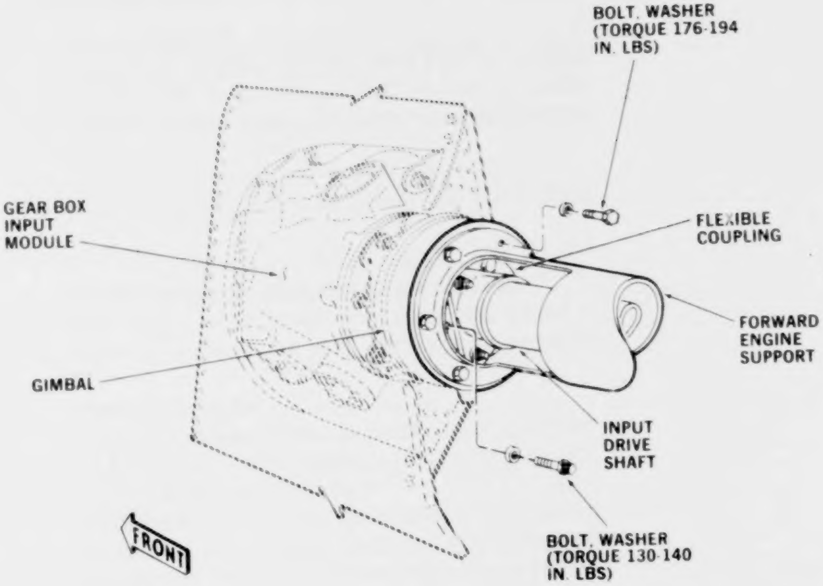
- Slide input drive shaft into engine and support tube as far as it will go.

STEP 6 CONNECT ENGINE MOUNTS (CONT)

- Place forward engine support on gimbal on input module.
- Bolt engine support to gimbal. **TORQUE BOLTS TO 176 - 194 INCH-POUNDS.**
- Install bolts in gear box input module flange. If bolts can be fully threaded by hand, replace input flange.

CAUTION

If any bolts or washers used to connect flexible coupling to gear box input module are being replaced, replace all bolts and washers with hardware kit 70000-10100-042.


BOLT, WASHER (TORQUE 176-194 IN. LBS)
GEAR BOX INPUT MODULE
FLEXIBLE COUPLING
FORWARD ENGINE SUPPORT
GIMBAL
INPUT DRIVE SHAFT
FRONT
BOLT, WASHER (TORQUE 130-140 IN. LBS)

S 45098.2 (C15)

Figure 1-6 (Sheet 2 of 2)

STEP 6 CONNECT ENGINE MOUNTS (CONT)

INSPECT

- Visually inspect output shaft installation bolts. Reject bolt if there is any sign of burrs or evidence of binding.
- Inspect installation bolts for binding in disc pack assembly by inserting bolts into disc pack only and checking for freedom of rotation. Bolts must be able to be turned by hand; if not, reject them.
  - If bolts are rejected, replace all bolts with new hardware kit. New bolts should turn freely in disc pack; if not, replace engine output shaft assembly and input module flange (TM 55-1520-237-23-7).

NOTE

To determine spread, measure gap between the disc laminations with a feeler gage.

- If any disc making up flexible coupling stackup is damaged, entire flexible coupling must be replaced. Flexible coupling discs are a matched set. Two or more discs between bolts on coupling flanges may separate or buckle. This is acceptable unless there is a sharp bend or crease in disc or if gap between 2 individual discs is over 0.030 inch.
- Inspect disc pack for dents and nicks. **DENTS AND NICKS LESS THAN 0.020 INCH ON THE EDGES OF INDIVIDUAL DISCS CAN BE BLENDED OUT.** Blend damage using abrasive cloth, Fed. Spec P-C-451, followed by crocus cloth, Fed. Spec P-C-458. **REPLACE OUTPUT SHAFT IF DAMAGE IS GREATER THAN 0.020 INCH.**
- Connect output drive shaft disc pack coupling to gear box input module with bolts and washers. **TORQUE BOLTS TO 130 - 140 INCH-POUNDS.**
- Deleted.
- Remove lifting sling from engine and move hoist out of way. Remove lifting sling from hoist.
- Check DA form 2408-13 to make sure three bolts securing disc pack coupling to input module flange are shown as due a torque check after first flight after installation.
- Perform engine output shaft vibration level check (TASK 2).

STEP 7 CONNECT ENGINE/AIRFRAME CONNECTIONS

CONNECT BLEED-AIR/ENGINE CONTROLS

- Connect cross bleed-air tube to firewall with new coupling, 710043-1.25-11 (Detail A). Place clamps next to beads on tubes. **TORQUE THUMBSCREWS TO 35 - 45 INCH-POUNDS.**
- Connect bleed-air line to starter and firewall with new couplings, 710043-1.25-11 (Detail A).

CAUTION

Make sure that rotary input alignment pin engages slot on engine hydromechanical unit. Handtighten retaining nut until it bottoms in support bracket. Slight axial/radial play is normal.

- Attach engine control input assemblies to hydromechanical unit on engine (Detail B).

CONNECT ELECTRICAL HARNESSES

- Uncap and connect electrical harnesses to firewall-mounted receptacles (Detail C).

CONNECT FUEL LINES

- Uncap engine drain hoses, and elbows, on rear engine compartment deck.
- Connect engine drain hoses to elbows on rear engine compartment deck (Detail D).
- Fasten common drain to engine compartment shield with clamp at station 381.40.
- On No. 1 engine only, clamp engine swirl frame drain to airframe at station 371.80.

NOTE

Common drains and swirl frame drains are clamped only on helicopters Serial No. 77-22727, 77-22728, and 78-22963 and subsequent.

- Uncap and connect fuel hose to fuel pump elbow.
- Check for 0.75-inch clearance between fuel hose and fire extinguisher nozzle. If clearance is not correct, do this:
  - Loosen bolts on fuel boost pump swivel flange.

STEP 7 CONNECT ENGINE/AIRFRAME CONNECTIONS (CONT)

- Carefully move fuel boost pump elbow until at least 0.75-inch clearance is obtained between fuel hose and fire extinguisher nozzle.
- **TORQUE BOLTS ON BOOST PUMP SWIVEL FLANGE TO 45 - 50 INCH-POUNDS.**

- **TORQUE NUT ON FUEL HOSE TO 300 - 500 INCH-POUNDS.**

INSTALL BLOWER DUCT

- Inspect inlet particle separator (IPS) duct for cracks. If repairs are needed, refer to TM 55-1520-237-23-10.

CAUTION

To prevent damage to engine cowling, make sure coupling is positioned with T-bolt nut inboard.

- Connect IPS duct to IPS blower with coupling (Figure 1-7, Detail F). **TORQUE COUPLING BOLT TO 60 - 70 INCH-POUNDS.** To seat clamp, tap it lightly with rubber or plastic hammer. Retorque clamp nut. Continue tapping clamp until two successive trials show no loss in torque. On No. 2 engine only, clamp engine control cables to IPS duct.

NOTE

When installing new IPS duct, refer to TM 55-1520-237-23-5.

- Clamp deswirl duct flange to engine power turbine flange as follows:
  - Make sure words LEFT ENGINE TOP LOOKING FORWARD are on top of left engine deswirl duct, and RIGHT ENGINE TOP LOOKING FORWARD are on top of right engine deswirl duct.
  - Make sure alignment hole in deswirl duct flange mates with alignment hole of power turbine module flange.
  - Lubricate pressure surfaces of clamp and T-bolt with lubricant, MIL-L-23699.
  - Install clamp over lips of deswirl duct and engine power turbine flange.

STEP 7 CONNECT ENGINE/AIRFRAME CONNECTIONS (CONT)

- Visually inspect inside deswirl duct to make sure deswirl duct flange mates with engine power turbine flange through 360°.
- **TORQUE CLAMP NUT TO 40 - 60 INCH-POUNDS.**
- To seat clamp, tap it lightly with rubber or plastic hammer. Retorque clamp nut. Continue tapping until two successive trials show no loss in torque.
- Loosen clamp nut slightly. **RETORQUE CLAMP NUT TO 40 - 60 INCH-POUNDS.**
- Visually inspect inside deswirl duct to make sure deswirl duct flange mates with engine power turbine flange through 360°.

STEP 7 CONNECT ENGINE/AIRFRAME CONNECTIONS (CONT)

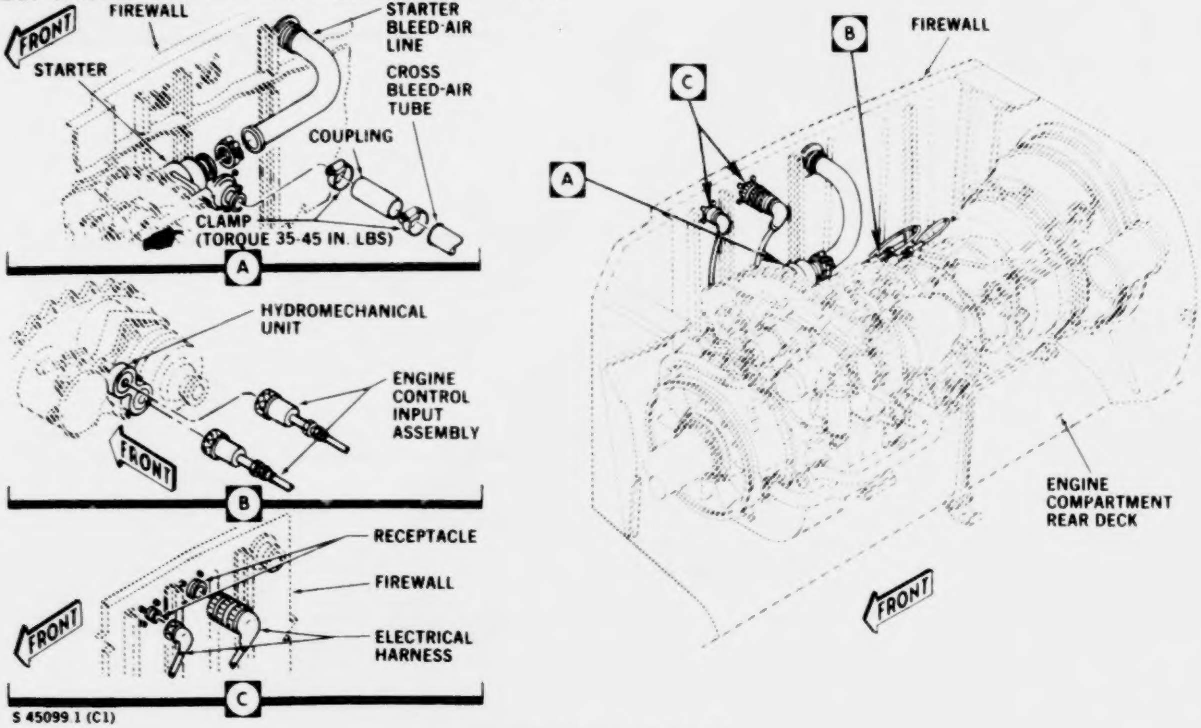

FRONT
FIREWALL
STARTER
STARTER BLEED-AIR LINE
CROSS BLEED-AIR TUBE
COUPLING
CLAMP (TORQUE 35-45 IN. LBS)
A
HYDROMECHANICAL UNIT
ENGINE CONTROL INPUT ASSEMBLY
FRONT
B
RECEPTACLE
FIREWALL
ELECTRICAL HARNESS
FRONT
C
S 45099.1 (C1)
B
FIREWALL
C
A
ENGINE COMPARTMENT REAR DECK
FRONT

Figure 1-7 (Sheet 1 of 2)

STEP 7 CONNECT ENGINE/AIRFRAME CONNECTIONS (CONT)

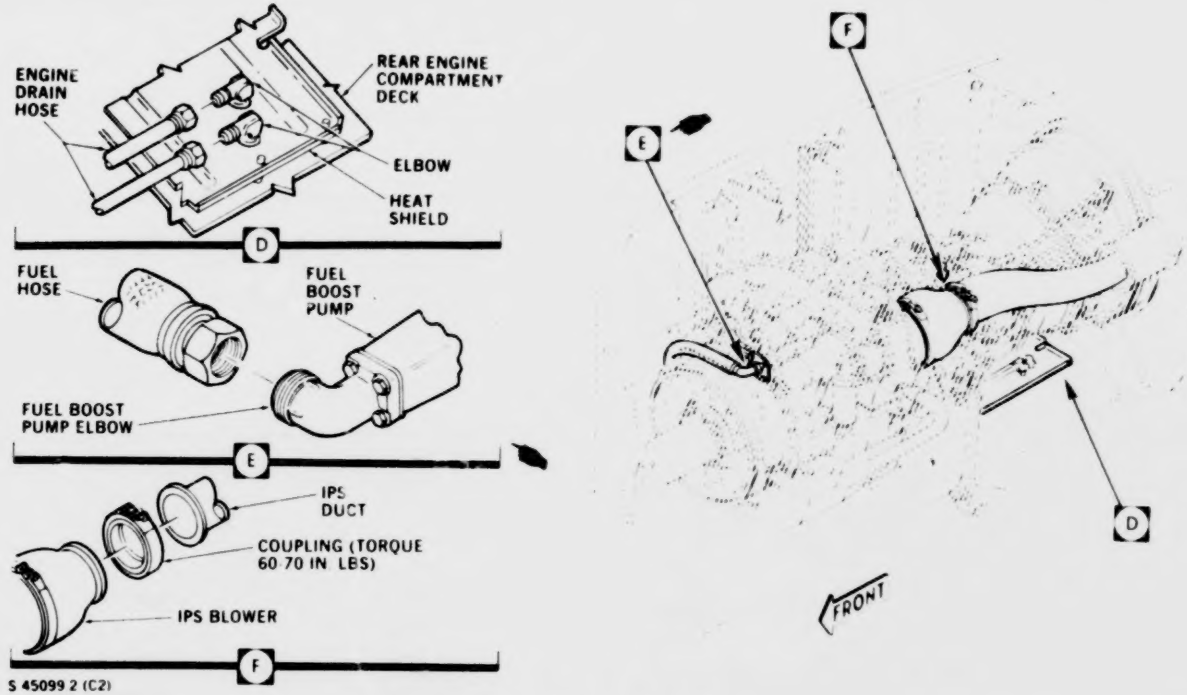

ENGINE DRAIN HOSE
REAR ENGINE COMPARTMENT DECK
ELBOW
HEAT SHIELD
D
FUEL HOSE
FUEL BOOST PUMP
FUEL BOOST PUMP ELBOW
E
IPS DUCT
COUPLING (TORQUE 60-70 IN. LBS)
IPS BLOWER
F
S 45099 2 (C2)
F
E
D
FRONT

Figure 1-7 (Sheet 2 of 2)

STEP 8 INSTALL AIR INLET

INSTALL

NOTE

- If required, adjust alignment pin and pin receptacle bracket (TM 55-1520-237-23-5).
- Be sure flange on air inlet and swirl frame on engine are clean.

- Apply a light coat of petrolatum, Fed. Spec VV-P-236, to mating surfaces of air inlet, swirl frame, and V-band coupling segments.

STEP 8 INSTALL AIR INLET (CONT)

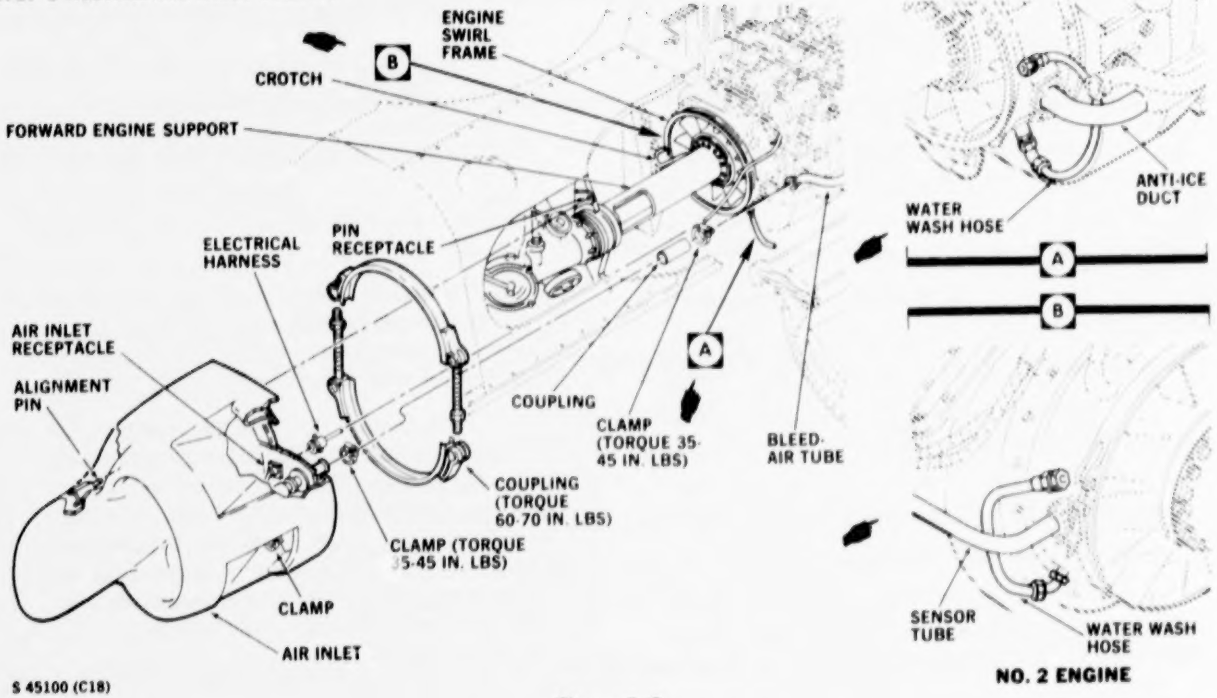
- Insert alignment pin in pin receptacle and slide air inlet rearward against engine swirlframe. Install coupling so inboard nut of coupling is facing up and outboard nut faces down. Tighten each nut a little at a time, while tapping lightly all around coupling with a plastic mallet. **WHEN COUPLING IS CORRECTLY SEATED, TORQUE COUPLING NUTS TO 60 - 70 INCH-POUNDS.**
- Connect bleed-air tube to air inlet with coupling, 710043-1.25-11. Place clamps next to beads on tubes. **TORQUE THUMBSCREWS TO 35 TO 45 INCH-POUNDS.** Torque clamp on engine end with nut forward and up.

NOTE

Prevent water wash line from chafing work platform fitting, by routing hose over anti ice duct on No. 1 engine and over sensor tube on engine No. 2.

- Clamp waterwash hose to air inlet scoop.
- Connect fire extinguishing tube on the air inlet to fitting on firewall. Clamp tube in place on air inlet.
- If deicing kit is installed on right inlet, connect ice detector wiring harness connector, P189, to electrical J189 on firewall.
- Connect electrical harness to air inlet receptacle.
- Install screws and bolt that hold fairing beneath air inlet.
- Inspect work area to make certain it is clean and free of all tools.
- Check engine oil level and service as required, (TM 55-1520-237-23-4).
- Close engine cowling and latch.
- Do engine drive shaft vibration level check (TASK 2).
- Do engine checkout procedure (TM 55-2840-248-23) as part of maintenance test flight.
- Check calibration of standby compass (TM 55-1500-204-25/1).
- Do a maintenance test flight (TM 55-1520-237-MTF).
- Check DA form 2408-13 that torque check is due (TM 55-1520-237-23-4).

STEP 8 INSTALL AIR INLET (CONT)


ENGINE SWIRL FRAME
B
CROTCH
FORWARD ENGINE SUPPORT
ELECTRICAL HARNESS
PIN RECEPTACLE
AIR INLET RECEPTACLE
ALIGNMENT PIN
A
COUPLING
CLAMP (TORQUE 35-45 IN. LBS)
BLEED-AIR TUBE
COUPLING (TORQUE 60-70 IN. LBS)
CLAMP (TORQUE 35-45 IN. LBS)
CLAMP
AIR INLET
WATER WASH HOSE
ANTI-ICE DUCT
A
B
SENSOR TUBE
WATER WASH HOSE
NO. 2 ENGINE

S 45100 (C18)

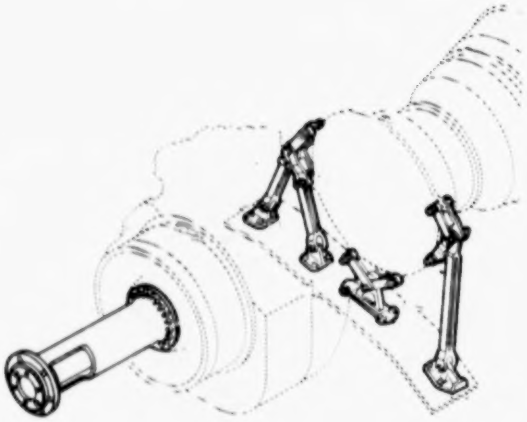
Figure 1-8

Pages 1-20.1/1-20.2 through 1-23/1-24 Deleted.
Figure 1-9 Deleted.

TASK 2

ENGINE MOUNTS/OUTPUT SHAFT - MAINTAIN

- **REPLACE AFT MOUNTS - STEP 1**
- **REPLACE FORWARD SUPPORT TUBE/ENGINE OUTPUT SHAFT - STEP 2**
- **ENGINE OUTPUT SHAFT VIBRATION CHECK - STEP 3**



S 45102 (C6)

PERSONNEL REQUIRED

- Two People Required: MOS 68B - Aircraft Powerplant Repairer
  MOS 67T - Tactical Transport Helicopter Repairer

SUPPLIES

- Abrasive Cloth, Fed. Spec P-C-451, No. 320, NSN 5350-00-240-0330 (STEP 2)
- Alodine, MIL-C-5541, NSN 8030-00-779-4699 (STEP 2)
- Cotter Pin, MS24665-153 (4 Required, STEP 1)
- Cotter Pin, MS24665-302 (3 Required, STEP 1)
- Cotter Pin, MS24665-304 (6 Required, STEP 1)
- Crocus Cloth, Fed. Spec P-C-458 (STEP 2)
- Degreasing Solvent, O-T-620, NSN 6810-00-930-6311 (STEP 1)
- Dry-Cleaning Solvent, Fed. Spec P-D-680, Type II, NSN 6850-00-274-5421 (STEP 2)
- Packing, M83248/1-135 (3 Required, STEP 2)
- Packing, 70351-08011-104 (1 Required, STEP 2)
- Petrolatum, Fed. Spec VV-P-236, NSN 9150-00-250-0926 (STEP 2)

SUPPLIES (CONT)
- Sealant, RTV106, NSN 8040-00-902-3871 (STEP 1)
- Sealant, RTV133, NSN 8040-01-168-0077 (STEP 1)
- Sealing Compound, MIL-S-8802, NSN 8030-00-753-5008 (STEPS 1, 3)
- Trichloroethane, O-T-620, NSN 6810-00-930-6311 (STEP 11)

TOOLS
- Chadwick Helmuth Balancer, 177M-6A (STEP 3)
- Chadwick Helmuth Cables, A4296-2 (STEP 3)
- Chadwick Helmuth Accelerometer, 4177B (STEP 3)
- Engine and Powertrain Repairer Toolkit, NSN 5180-00-323-4944
- Torque Wrench, 30 - 150 in-lbs, NSN 5120-00-542-4489 (STEPS 1, 2)
- Torque Wrench, 150 - 750 in-lbs, NSN 5120-00-821-3441 (STEPS 1, 3)

ALSO NEEDED
- TASK 1 (STEPS 1, 2)
- TASK 22 (STEP 1)
- TM 55-1500-204-25/1 (STEP 2)
- TM 55-1520-237-MTF (STEP 2)
- TM 55-1520-237-23-4 (STEP 2)
- TM 55-1520-237-23-5 (STEP 1)
- TM 55-2840-248-23 (STEP 2)

TASK 2

ENGINE MOUNTS

STEP 1 REPLACE AFT MOUNTS

NOTE

The following procedures apply to both No. 1 and No. 2 engines.

REMOVE

- Open engine cowling.
- Disconnect coupling and remove inlet particle separator (IPS) duct from IPS blower.
- Install lifting sling (TASK 1).
- Unbolt outer mount strut from engine compartment deck mount fitting and upper links from engine. Remove outer mount from helicopter.
- Unbolt and remove links from strut.
- Unbolt inner mount struts from engine compartment deck mount fittings and upper links from engine. Remove inner mount from helicopter.
- Unbolt and remove links from strut. Unbolt and separate struts.
- Unbolt links from support fitting under engine combustor section on engine compartment deck.

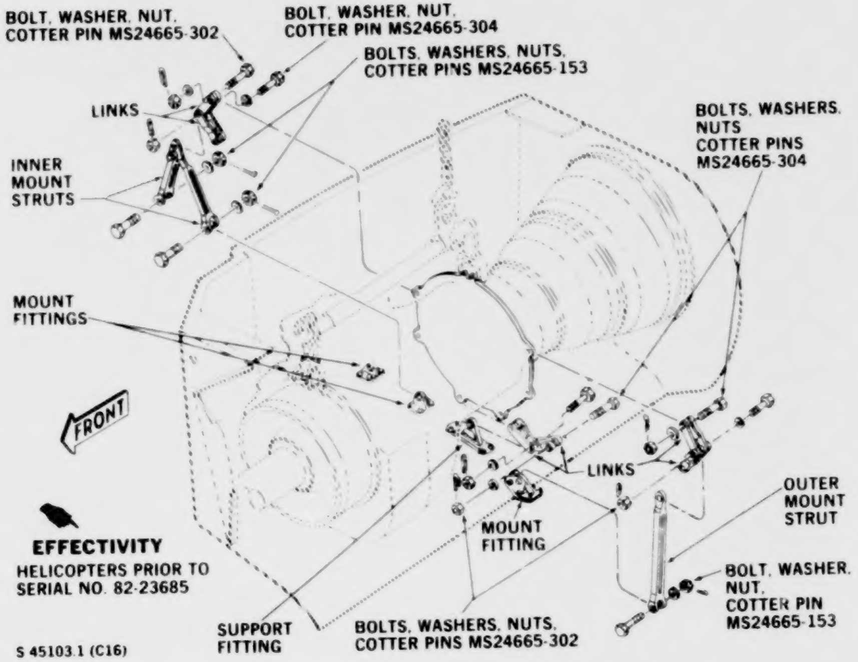
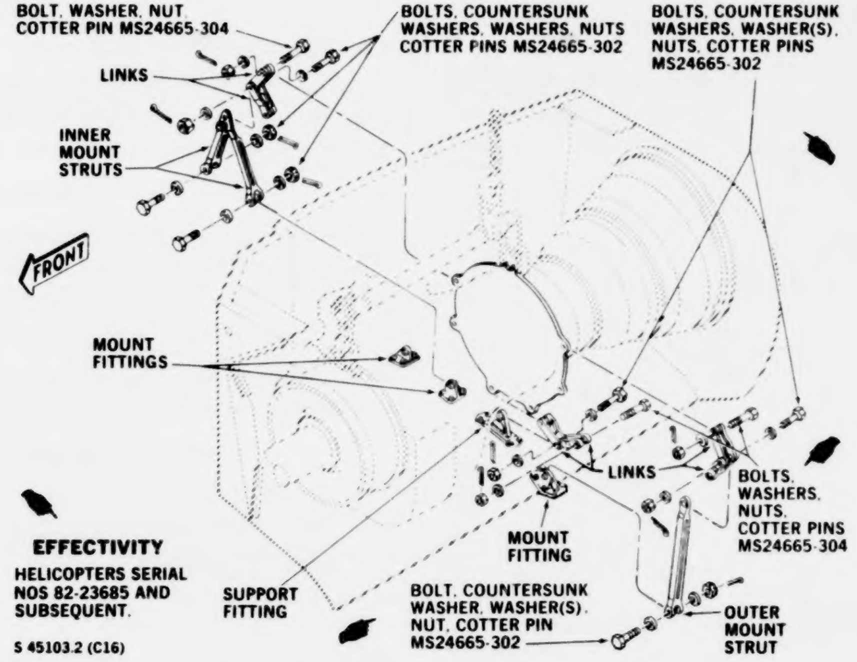

BOLT, WASHER, NUT, COTTER PIN MS24665-302
BOLT, WASHER, NUT, COTTER PIN MS24665-304
BOLTS, WASHERS, NUTS, COTTER PINS MS24665-153
LINKS
INNER MOUNT STRUTS
BOLTS, WASHERS, NUTS COTTER PINS MS24665-304
MOUNT FITTINGS
FRONT
LINKS
OUTER MOUNT STRUT
MOUNT FITTING
EFFECTIVITY
HELICOPTERS PRIOR TO SERIAL NO. 82-23685
BOLT, WASHER, NUT, COTTER PIN MS24665-153
SUPPORT FITTING
BOLTS, WASHERS, NUTS, COTTER PINS MS24665-302
S 45103.1 (C16)

Figure 2-1 (Sheet 1 of 4)

STEP 1 REPLACE AFT MOUNTS (CONT)


BOLT, WASHER, NUT, COTTER PIN MS24665-304
BOLTS, COUNTERSUNK WASHERS, WASHERS, NUTS COTTER PINS MS24665-302
BOLTS, COUNTERSUNK WASHERS, WASHER(S), NUTS, COTTER PINS MS24665-302
LINKS
INNER MOUNT STRUTS
FRONT
MOUNT FITTINGS
LINKS
BOLTS, WASHERS, NUTS, COTTER PINS MS24665-304
MOUNT FITTING
SUPPORT FITTING
BOLT, COUNTERSUNK WASHER, WASHER(S), NUT, COTTER PIN MS24665-302
OUTER MOUNT STRUT

EFFECTIVITY

HELICOPTERS SERIAL NOS 82-23685 AND SUBSEQUENT.

S 45103.2 (C16)

Figure 2-1 (Sheet 2 of 4)

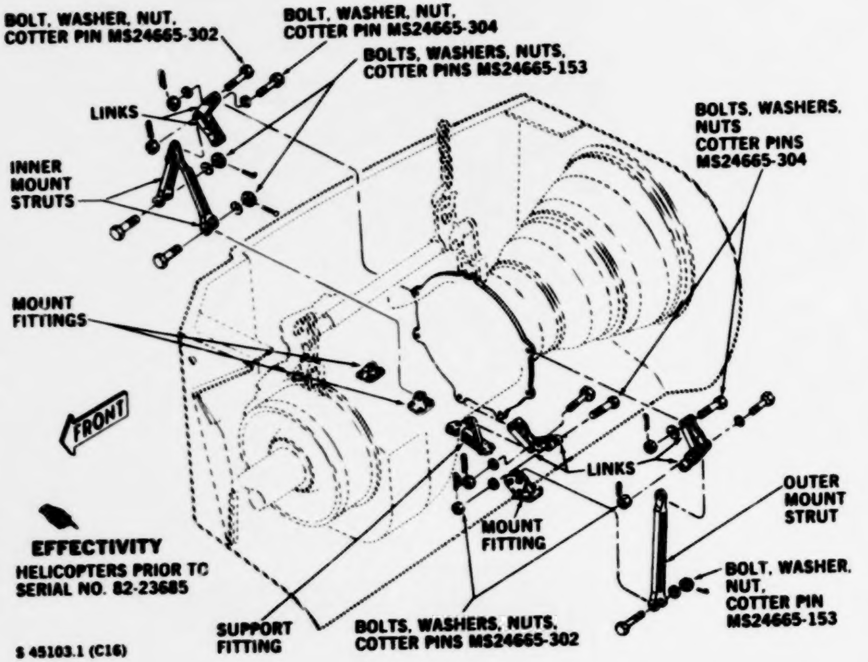
STEP 1 REPLACE AFT MOUNTS

NOTE

The following procedures apply to both No. 1 and No. 2 engines.

REMOVE

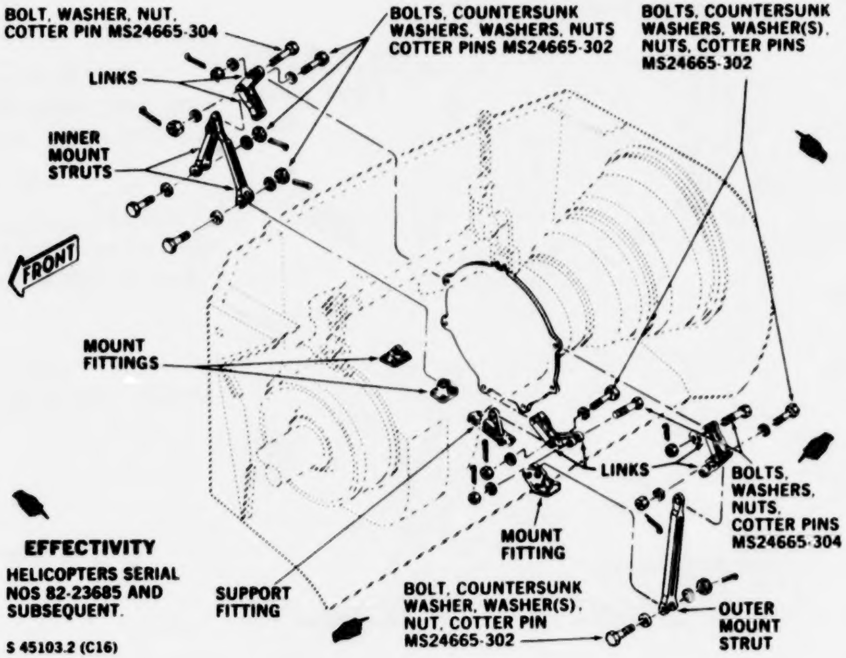
- Open engine cowling.
- Disconnect coupling and remove inlet particle separator (IPS) duct from IPS blower.
- Install lifting sling (TASK 1).
- Unbolt outer mount strut from engine compartment deck mount fitting and upper links from engine. Remove outer mount from helicopter.
- Unbolt and remove links from strut.
- Unbolt inner mount struts from engine compartment deck mount fittings and upper links from engine. Remove inner mount from helicopter.
- Unbolt and remove links from strut. Unbolt and separate struts.
- Unbolt links from support fitting under engine combustor section on engine compartment deck.


BOLT, WASHER, NUT, COTTER PIN MS24665-302
BOLT, WASHER, NUT, COTTER PIN MS24665-304
BOLTS, WASHERS, NUTS, COTTER PINS MS24665-153
LINKS
INNER MOUNT STRUTS
BOLTS, WASHERS, NUTS COTTER PINS MS24665-304
MOUNT FITTINGS
FRONT
LINKS
OUTER MOUNT STRUT
MOUNT FITTING
BOLT, WASHER, NUT, COTTER PIN MS24665-153
SUPPORT FITTING
BOLTS, WASHERS, NUTS, COTTER PINS MS24665-302
S 45103.1 (C16)

EFFECTIVITY
HELICOPTERS PRIOR TC SERIAL NO. 82-23685

Figure 2-1 (Sheet 1 of 4)

STEP 1 REPLACE AFT MOUNTS (CONT)


BOLT, WASHER, NUT, COTTER PIN MS24665-304
BOLTS, COUNTERSUNK WASHERS, WASHERS, NUTS COTTER PINS MS24665-302
BOLTS, COUNTERSUNK WASHERS, WASHER(S), NUTS, COTTER PINS MS24665-302
LINKS
INNER MOUNT STRUTS
FRONT
MOUNT FITTINGS
LINKS
BOLTS, WASHERS, NUTS, COTTER PINS MS24665-304
MOUNT FITTING
SUPPORT FITTING
BOLT, COUNTERSUNK WASHER, WASHER(S), NUT, COTTER PIN MS24665-302
OUTER MOUNT STRUT

EFFECTIVITY

HELICOPTERS SERIAL NOS 82-23685 AND SUBSEQUENT.

S 45103.2 (C16)

Figure 2-1 (Sheet 2 of 4)

Pages 2-4.1 through 2-4.4 deleted.

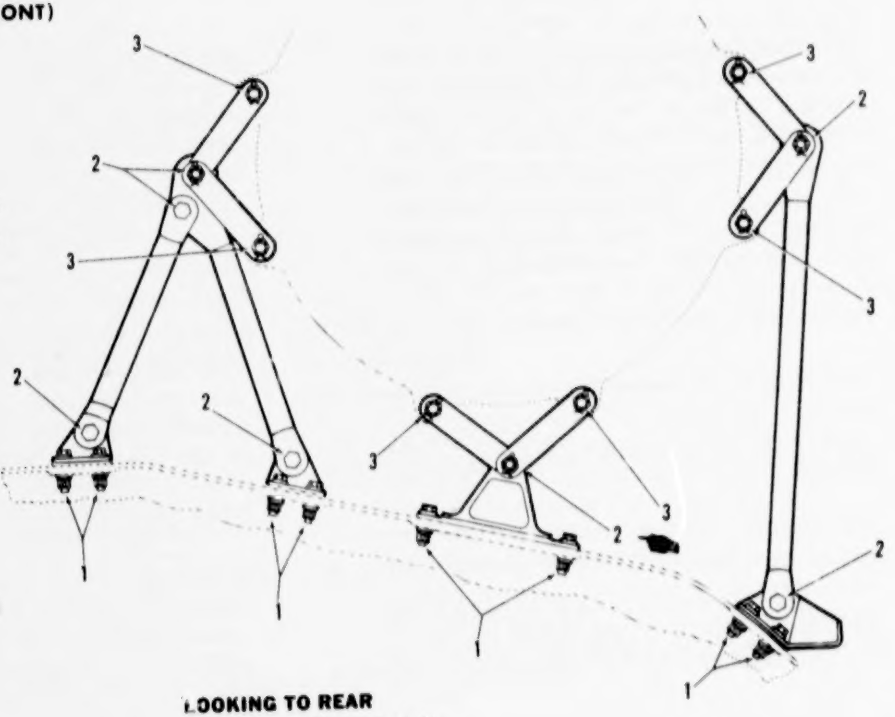
STEP 1 REPLACE AFT MOUNTS (CONT)

TORQUE TABLE

LOCATION	TORQUE
1	119-131 IN.-LBS
2	181-199 IN. LBS
3	TIGHTEN NUT FINGERTIGHT. ADVANCE TO NEXT CASTELLATION AND INSERT COTTER PIN.

EFFECTIVITY

HELICOPTERS SERIAL NOS 83-23685 AND SUBSEQUENT



S 45103.4 (C18)

LOOKING TO REAR

Figure 2-1 (Sheet 4 of 4)

STEP 1 REPLACE AFT MOUNTS (CONT)

INSTALL

NOTE

Place shim washers, as required, under nuts to allow for different bolt lengths.

- Clean area on deck where mount fittings are installed using a wooden or plastic scraper and a clean cloth dampened with degreasing solvents, O-T-620. Do not allow solvent to dry on deck. Keep turning cloth after each wipe.
- Wipe area dry with a clean cloth.

CAUTION

Loss of torque may result if sealant, RTV106, is applied to threads of bolts. Do not apply sealant, RTV106, to threads of bolts.

- Apply a light coat of sealant, RTV106, to bottom of mount fittings and to bolt grip.
- Install mount fittings on deck with bolts, washers, (countersunk washer next to bolthead), and nuts. **TORQUE NUTS TO 119 - 131 INCH-POUNDS.**
- Apply a bead of sealing compound, MIL-S-8802, around edges of mount fittings, boltheads, and nuts.
- Install overhead soundproofing as required (TM 55-1520-237-23-5).
- On helicopters prior to serial No. 82-23685, do this:
  - Bolt links to support fitting under engine combustor section with bolthead toward rear of engine. **TIGHTEN EACH NUT FINGERTIGHT, ADVANCE NUT TO NEXT SLOT, AND INSTALL COTTER PIN, MS24665-304.**
  - Bolt links to support under engine combustor section on engine compartment deck. Bolthead shall be toward rear of engine. **TIGHTEN NUT FINGERTIGHT, ADVANCE NUT TO NEXT SLOT, AND INSTALL COTTER PIN, MS24665-302.**

STEP 1 REPLACE AFT MOUNTS (CONT)

- Bolt inner mount struts together. **TORQUE NUT TO 60 - 100 INCH-POUNDS.** Install cotter pin, MS24665-153. Bolt links to strut. **TIGHTEN NUT FINGERTIGHT, ADVANCE NUT TO NEXT SLOT, AND INSTALL COTTER PIN, MS24665-302.** Make sure boltheads are towards rear of engine when inner mount is installed.
- Bolt inner mount links to engine with boltheads toward rear of engine. **TIGHTEN EACH NUT FINGERTIGHT, ADVANCE NUT TO NEXT SLOT, AND INSTALL COTTER PIN, MS24665-304.**
- Bolt inner mount struts to engine compartment deck mount fittings with boltheads towards front of engine. **TORQUE NUTS TO 60 - 100 INCH-POUNDS.** Install cotter pins, MS24665-153.
- Bolt outer mount links to strut. **TIGHTEN NUT FINGERTIGHT, ADVANCE NUT TO NEXT SLOT, AND INSTALL COTTER PIN, MS24665-302.** Make sure bolthead is towards rear of engine when engine mount is installed.
- Bolt outer mount links to engine with boltheads towards rear of engine. **TIGHTEN EACH NUT FINGERTIGHT, ADVANCE NUT TO NEXT SLOT, AND INSTALL COTTER PIN, MS24665-304.**
- Bolt outer mount strut to engine compartment deck mount fitting with bolthead towards front of engine. **TORQUE NUT TO 60 - 100 INCH-POUNDS.** Install cotter pin, MS24665-153.

- On helicopters serial Nos 82-23685 and subsequent, do this:
  - Bolt links to support fitting under engine combustor section with boltheads toward rear of engine. **TIGHTEN EACH NUT FINGERTIGHT, ADVANCE NUT TO NEXT SLOT, AND INSTALL COTTER PIN, MS24665-304.**
  - Bolt links to support under engine combustor section on engine compartment deck. Bolthead shall be toward rear of engine. **TORQUE NUT TO 181 - 199 INCH-POUNDS.** Install cotter pin, MS24665-153.

STEP 1 REPLACE AFT MOUNTS (CONT)

- Bolt inner mount struts together with countersunk washer under bolthead. Make sure bolthead is toward front of engine. **TORQUE NUT TO 181 - 199 INCH-POUNDS.** Install cotter pin, MS24665-153.

- Bolt links to strut with countersunk washer under bolthead. **TORQUE NUT TO 181 - 199 INCH-POUNDS AND INSTALL COTTER PIN, MS24665-302.** Make sure boltheads are towards rear of engine when inner mount is installed.

- Bolt inner mount links to engine with boltheads toward rear of engine. **TIGHTEN EACH NUT FINGERTIGHT, ADVANCE NUT TO NEXT SLOT, AND INSTALL COTTER PIN, MS24665-304.**

- Bolt inner mount struts, with countersunk washers under boltheads to engine compartment deck mount fittings. Make sure boltheads are towards front of engine. **TORQUE NUTS TO 181 - 199 INCH-POUNDS.** Install cotter pins, MS24665-153.

- Bolt outer mount links to strut with countersunk washer under bolthead. Make sure bolthead is towards rear of engine when engine is installed. **TORQUE NUT TO 181 - 199 INCH-POUNDS.** Install cotter pin, MS24665-302.

- Bolt outer mount links to engine with boltheads towards rear of engine. **TIGHTEN EACH NUT FINGERTIGHT, ADVANCE NUT TO NEXT SLOT, AND INSTALL COTTER PIN, MS24665-304.**

- Bolt outer mount strut, with countersunk washer under bolthead, to engine compartment deck mount fitting. Make sure bolthead is towards front of engine. **TORQUE NUT TO 181 - 199 INCH-POUNDS.** Install cotter pin, MS24665-153.

STEP 1 REPLACE AFT MOUNTS (CONT)

- Unbolt and remove links from engine and helicopter.
- Remove overhead soundproofing in cabin as required.
- Unbolt and remove mount fittings from deck.

INSPECT

- Deleted.
- Check bearing radial play by doing this:
  - Install bolt, nut in bearing.
  - Clamp bolt in vise.
  - Clamp dial indicator to vise, place tip of indicator on fitting or strut.
- **IF RADIAL PLAY IS GREATER THAN 0.005-INCH, REPLACE BEARING (TASK 22).**
- Check bearing axial play by doing this:
  - Install bolt, nut in bearing.

CAUTION

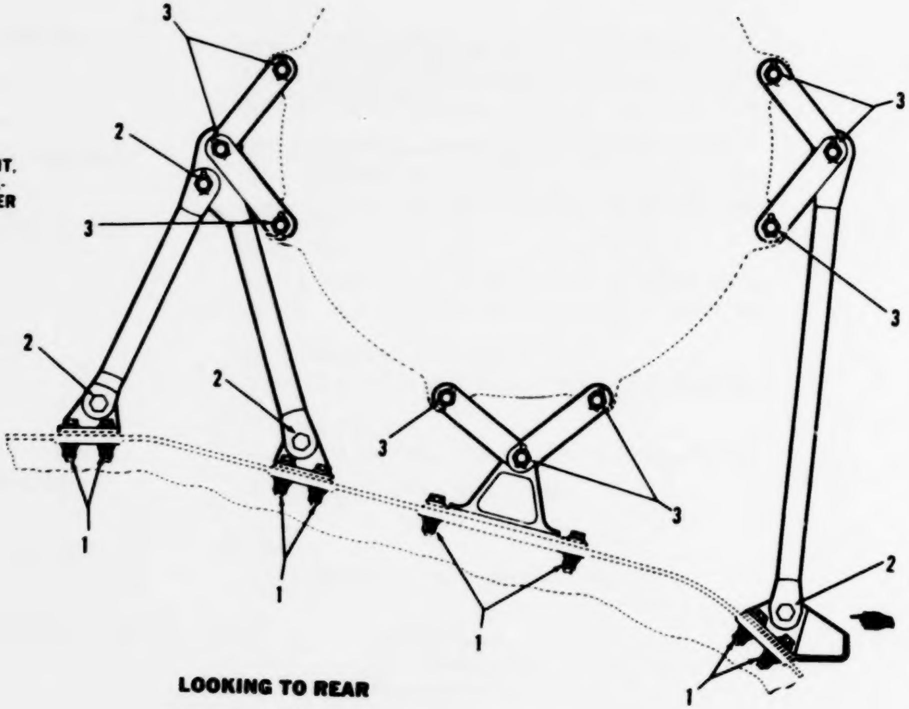
Pad fitting or strut before clamping in vise.

  - Clamp fitting or strut in vise.
  - Clamp dial indicator on vise, place tip of indicator on bolt.
- **IF AXIAL PLAY IS GREATER THAN 0.020-INCH, REPLACE BEARING (TASK 22).**
- Check hole in inner mount strut for wear. **REPLACE STRUT IF HOLE DIAMETER IS MORE THAN 0.315-INCH.**
- Inspect mount struts for cracks, nicks, gouges, and scratches. **IF DAMAGE IS FOUND OR SUSPECTED, DO A DETAILED INSPECTION (TASK 22).**
- Inspect mount fittings for cracks, nicks, gouges, and scratches. **IF DAMAGE IS FOUND OR SUSPECTED, DO A DETAILED INSPECTION (TASK 22).**

STEP 1 REPLACE AFT MOUNTS (CONT)

TORQUE TABLE

LOCATION	TORQUE
1	119-131 IN.-LBS
2	60-100 IN. LBS
3	TIGHTEN NUT FINGERTIGHT. ADVANCE TO NEXT CASTELLATION AND INSERT COTTER PIN.



EFFECTIVITY
HELICOPTERS PRIOR
TO SERIAL NO. 82-23685

S 45103.3

LOOKING TO REAR

Figure 2-1 (Sheet 3 of 4)

Pages 2-6.1 and 2-6.2 deleted.

STEP 2 REPLACE FORWARD SUPPORT TUBE/ENGINE OUTPUT SHAFT (CONT)

- Blend damaged area that is through cadmium-plating into base metal, removing least amount of material, using 400-grit abrasive cloth, Fed. Spec P-C-451.
- Polish blended area to remove abrasive marks and match surface smoothness using crocus cloth, Fed. Spec P-C-458.
- Clean reworked area with dry-cleaning solvent, P-D-680, Type II.
- Brush Alodine on reworked area (TM 55-1500-204-25/1).

STEP 2 REPLACE FORWARD SUPPORT TUBE/ENGINE OUTPUT SHAFT (CONT)

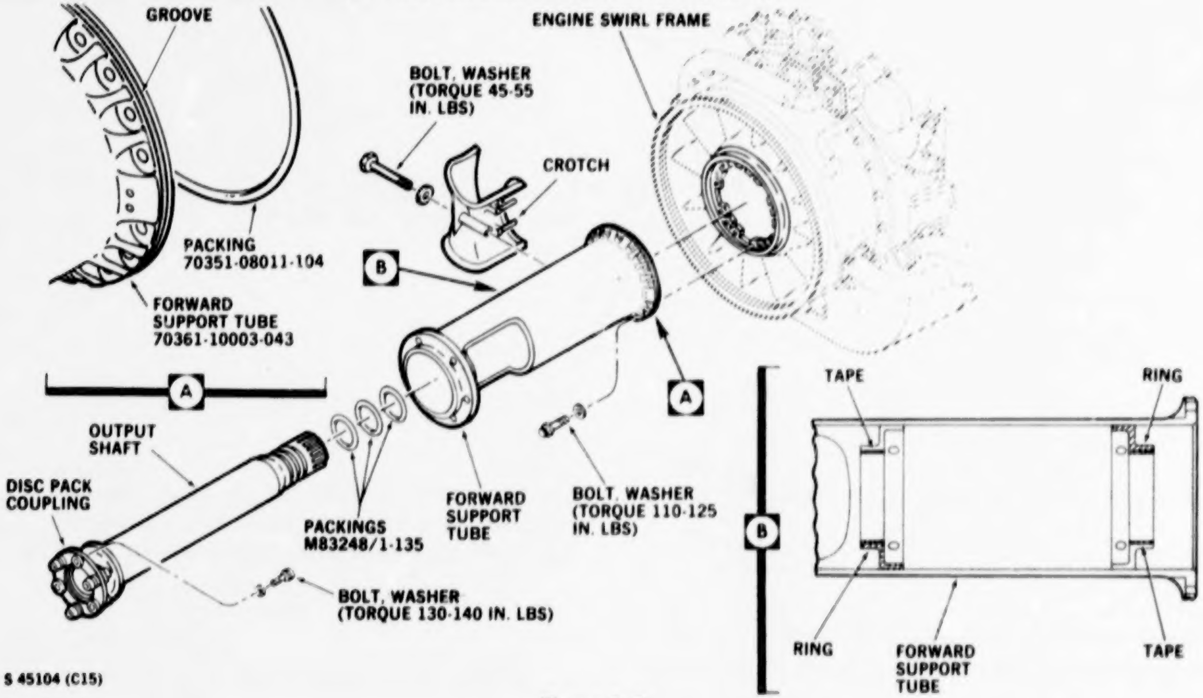

GROOVE
ENGINE SWIRL FRAME
BOLT, WASHER (TORQUE 45-55 IN. LBS)
CROTCH
PACKING 70351-08011-104
B
FORWARD SUPPORT TUBE 70361-10003-043
A
A
OUTPUT SHAFT
DISC PACK COUPLING
PACKINGS M83248/1-135
FORWARD SUPPORT TUBE
BOLT, WASHER (TORQUE 110-125 IN. LBS)
BOLT, WASHER (TORQUE 130-140 IN. LBS)
TAPE
RING
B
RING
FORWARD SUPPORT TUBE
TAPE
S 45104 (C15)

Figure 2-2

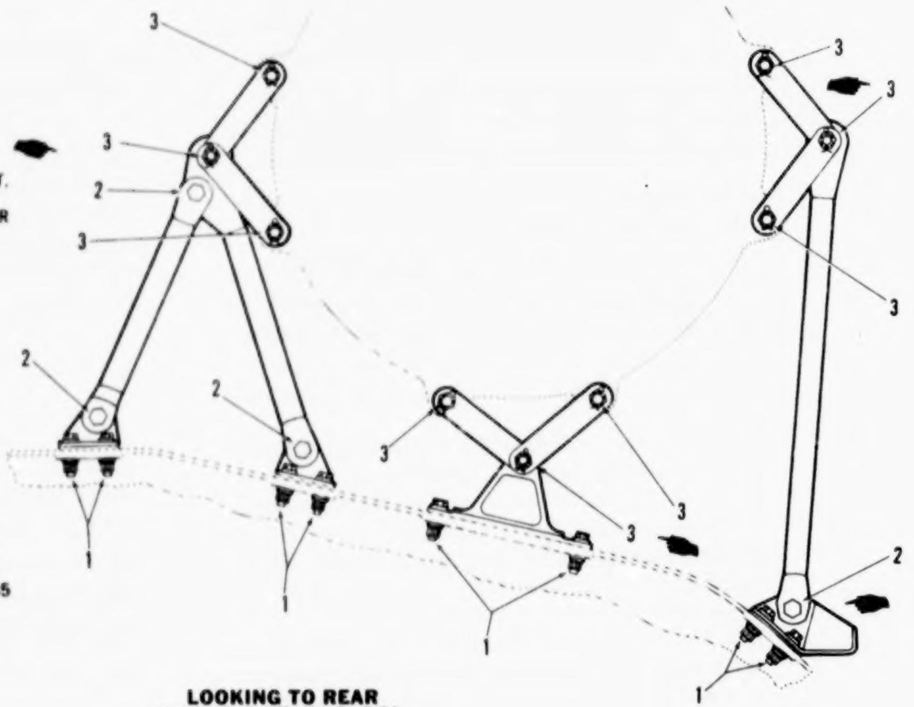
STEP 1 REPLACE AFT MOUNTS (CONT)

TORQUE TABLE

LOCATION	TORQUE
1	119-131 IN.-LBS
2	181-199 IN. LBS
3	TIGHTEN NUT FINGERTIGHT. ADVANCE TO NEXT CASTELLATION AND INSERT COTTER PIN.

EFFECTIVITY

HELICOPTERS SERIAL NOS 82-23685 AND SUBSEQUENT



S 45103.4

LOOKING TO REAR
Figure 2-1 (Sheet 4 of 4)

STEP 1 REPLACE AFT MOUNTS (CONT)

- Inspect mount links for cracks, nicks, gouges, and scratches. **IF DAMAGE IS FOUND OR SUSPECTED, DO A DETAILED INSPECTION (TASK 22).**
- Inspect support fitting for cracks, nicks, gouges, and scratches. **IF DAMAGE IS FOUND OR SUSPECTED, DO A DETAILED INSPECTION (TASK 22).**

INSTALL

NOTE

Make sure all bolts are installed in same direction.

- Clean area on deck where mount fittings are installed using a wooden or plastic scraper and a clean cloth dampened with trichloroethane solvent, O-T-620. Do not allow solvent to dry on deck. Keep turning cloth after each wipe.
- Wipe area dry with a clean cloth.
- Install inner and outer mount fittings and support fitting on deck with bolts, countersunk washers, washers, and nuts. Make sure countersunk side of washer faces bolthead. **TORQUE NUTS TO 119 - 131 INCH-POUNDS.**
- Apply sealant, RTV133, to all mating edges of engine mount shims, engine mount fitting, aircraft skin, and all boltheads.
- Install overhead soundproofing as required (TM 55-1520-237-23-5).

STEP 1 REPLACE AFT MOUNTS (CONT)

- Shim with AN960C816 washers, if required, to install cotter pin when connecting center mount links to mounting flange.
- Bolt center mount links to mounting flange under combustor on bottom of engine with bolts, countersunk washers, washers, and nuts. Make sure countersunk side of washers face bolthead. **TIGHTEN EACH NUT FINGERTIGHT, ADVANCE NUT TO NEXT CASTELLATION.** Install cotter pin, MS24665-304.
- On helicopters prior to serial No. 82-23685, do this:
  - Shim with AN960C616 and AN960C616L washers, if required, to install cotter pin when connecting center mount links to support fitting.
  - Bolt center mount links to support fitting under engine combustor section on engine compartment deck with bolt, washers, and nut. **TIGHTEN NUT FINGERTIGHT, ADVANCE NUT TO NEXT CASTELLATION.** Install cotter pin, MS24665-302.
  - Shim with AN960C516 and AN960C516L washers, if required, to install cotter pin when connecting inner mount struts together.
  - Bolt inner mount struts together with bolt, washers, and nut. **TORQUE TO 60 - 100 INCH-POUNDS.** Install cotter pin, MS24665-153.
  - Shim with AN960C616 or AN960C616L washers, if required, to install cotter pin when connecting inner mount struts to mount links.
  - Bolt inner mount struts to mount links with bolt, washers, and nuts. **TIGHTEN NUT FINGERTIGHT. ADVANCE NUT TO NEXT CASTELLATION.** Install cotter pin, MS24665-302.
  - Shim with AN960C816 washers, if required, to install cotter pin when connecting outer mount links to engine.
  - Bolt inner mount links to engine mounting flange with bolts, countersunk washers, washers, and nuts. Make sure countersunk side of washers face bolthead. **TIGHTEN EACH NUT FINGERTIGHT, ADVANCE NUT TO NEXT CASTELLATION.** Install cotter pin, MS24665-304.

STEP 1 REPLACE AFT MOUNTS (CONT)

- Shim with AN960C516 and AN960C516L washers, if required, to install cotter pin when connecting inner mount struts to mount fittings.
- Bolt inner mount struts to engine compartment deck mount fittings with bolts, washers, and nuts. **TORQUE NUTS TO 60 - 100 INCH-POUNDS.** Install cotter pins, MS24665-153.
- Shim with washers, AN960C616 or AN960C616L, if required to install cotter pin when connecting outer mount links to mount strut.
- Bolt outer mount links to mount strut with bolt, washers, and nut. **TIGHTEN NUT FINGERTIGHT, ADVANCE NUT TO NEXT CASTELLATION.** Install cotter pin, MS24665-302.
- Shim with AN960C816 washers, if required, to install cotter pin when connecting outer mount links to engine.
- Bolt outer mount links to engine mounting flange with bolts, countersunk washers, washers, and nuts. Make sure countersunk side of washers face bolthead. **TIGHTEN EACH NUT FINGERTIGHT, ADVANCE NUT TO NEXT CASTELLATION.** Install cotter pin, MS24665-304.
- Shim with AN960C516 or AN960C516L washers, if required, to install cotter pin when connecting outer mount strut to mount fitting.
- Bolt outer mount strut to mount fitting with bolt, washers, and nut. **TORQUE NUT TO 60 - 100 INCH-POUNDS.** Install cotter pin, MS24665-153.

- On helicopters serial Nos 82-23685 and subsequent, do this:
  - Shim with AN960C616 and AN960C616L washers, if required, to install cotter pin when connecting center mount links to support fitting.

STEP 1 REPLACE AFT MOUNTS (CONT)

- Bolt center mount links to support fitting under engine combustor section on engine compartment deck with bolt, countersunk washer, washers, and nut. **TIGHTEN NUT UNTIL FIRMLY SEATED, THEN BACK OFF UNTIL WASHER UNDER NUT CAN BE TURNED BY HAND. RETIGHTEN NUT JUST ENOUGH SO THAT WASHER CANNOT BE TURNED BY HAND, THEN TIGHTEN NUT TO NEXT CASTELLATION.** Install cotter pin MS24665-302. **DO NOT TIGHTEN NUT MORE THAN ONE CASTELLATION.** Shim if required to install cotter pin.
- Shim with AN960C516 and AN960C516L washers, if required, to install cotter pin when connecting inner mount strut together.
- Bolt inner mount struts together with bolt, countersunk washers, washers, and nut. Make sure countersunk side of washer faces bolthead. **TORQUE NUT TO 181 - 199 INCH-POUNDS.** Install cotter pin, MS24665-153.
- Shim with AN960C616 or AN960C616L washers, if required, to install cotter pin when connecting mount links to inner mount strut.
- Bolt mount links to inner mount strut with bolt, washers, and nut. **TORQUE NUT TO 181 - 199 INCH-POUNDS.** Install cotter pin, MS24665-302.
- Shim with AN960C816 washers, if required, to install cotter pin when connecting inner mount links to engine.
- Bolt inner mount links to engine with bolts, countersunk washers, washers, and nuts. Make sure countersunk side of washer faces bolthead. **TIGHTEN EACH NUT FINGERTIGHT, ADVANCE NUT TO NEXT CASTELLATION.** Install cotter pin, MS24665-304.
- Shim with AN960C516 or AN960C516L washers, if required, to install cotter pin when connecting inner mount struts to mount fitting.

STEP 1 REPLACE AFT MOUNTS (CONT)

- Bolt inner mount struts to mount fittings with bolts, countersunk washers, washers, and nuts. Make sure countersunk side of washers face bolthead. **TORQUE NUTS TO 181 - 199 INCH-POUNDS.** Install cotter pins, MS24665-153.

- Shim with AN960C616 and AN960C616L washers, if required, to install cotter pin when connecting mount links to outer mount strut.

- Bolt outer mount links to strut with bolts, washers, and nut. **TORQUE NUT TO 181 - 199 INCH-POUNDS.** Install cotter pin, MS24665-302.

- Shim with AN960C816 washers, if required, to install cotter pin when connecting outer mount links to engine.
- Bolt outer mount links to engine with bolts, countersunk washers, washers, and nuts. Make sure countersunk side of washers face bolthead. **TIGHTEN EACH NUT FINGERTIGHT, ADVANCE NUT TO NEXT CASTELLATION.** Install cotter pin, MS24665-304.
- Shim with AN960C516 or AN960C516L washers, if required, to install cotter pin when connecting outer mount strut to mount fitting.
- Bolt outer mount strut to mount fitting with bolt, countersunk washers, washers, and nut. Make sure countersunk side of washer faces bolthead. **TORQUE NUT TO 181 - 199 INCH-POUNDS.** Install cotter pin, MS24665-153.

STEP 2 REPLACE FORWARD SUPPORT TUBE/ENGINE OUTPUT SHAFT

NOTE

The following procedures apply to both No. 1 and No. 2 engines.

REMOVE

- Open engine cowling.
- Remove engine air inlet and disconnect engine/airframe connections (TASK 1).
- Attach lifting sling to engine (TASK 1).
- Disconnect engine mounts (TASK 1).
- Raise engine high enough off engine compartment deck to clear gear box input module.
- Unbolt crotch from forward support tube. Slide crotch from forward support tube.
- Pull shaft from forward support tube and engine.
- Remove packings from shaft.
- Unbolt forward support tube from engine swirl frame, remove support tube from engine, discard packing.

INSPECT SUPPORT TUBE

- Inspect ring assembly ID (small) for damage to Zetex tape. Replace support tube if tape is loose, or missing.
- Check support tube for nicks, scratches, gouges, or damage. Repair or replace support tube, as required.

INSPECT ENGINE OUTPUT SHAFT INSTALLATION

- Do a special inspection after engine output shaft/input module flange connection is untorqued or shaft is removed (TM 55-1520-237-23-4).

REPAIR SHAFT

- On helicopters with support tube, Part No. 70361-10003-043, remove packing, 70351-08011-104.
- Check that polished-out damage will not be more than limits given in Table 2-1. Replace shaft if repair is more than limit given.

STEP 2 REPLACE FORWARD SUPPORT TUBE/ENGINE OUTPUT SHAFT (CONT)

- Any scratches, through cadmium-plating only, may be blended smooth using abrasive cloth, Fed. Spec P-C-451.
- Blend damaged area that is through cadmium-plating into base metal, removing least amount of material, using 400-grit abrasive cloth, Fed. Spec P-C-451.
- Polish blended area to remove abrasive marks and match surface smoothness using crocus cloth, Fed. Spec P-C-458.
- Clean reworked area with dry-cleaning solvent, P-D-680, Type II.
- Brush Alodine on reworked area (TM 55-1500-204-25/1).

REPAIR SUPPORT TUBE

- Repair support tube with scratches, dents, and gouges less than 0.015 inch deep by 0.030 inch wide by 0.500 inch long.
- Replace tube if damage is more than limits given.
- Blend damaged area to at least 0.500-inch radius, removing least amount of material, using No. 400-grit abrasive cloth, Fed. Spec P-C-451.
- Polish blended area to remove abrasive marks and match surface smoothness using crocus cloth, Fed. Spec P-C-458.
- Clean reworked area with dry-cleaning solvent, P-D-680, Type II.
- Brush alodine reworked area (TM 55-1500-204-25/1).

NOTE

Make sure polished-out damage will not be greater than allowable limits.

REPAIR SUPPORT TUBE FLANGE

- Repair support tube flanges with scratches, dents or gouges less than 0.015 inches deep and 0.030 inches wide. There cannot be more than four damaged areas in a 2-inch arc on flange.
- Replace support tube if damage is greater than limits given.

STEP 2 REPLACE FORWARD SUPPORT TUBE/ENGINE OUTPUT SHAFT (CONT)

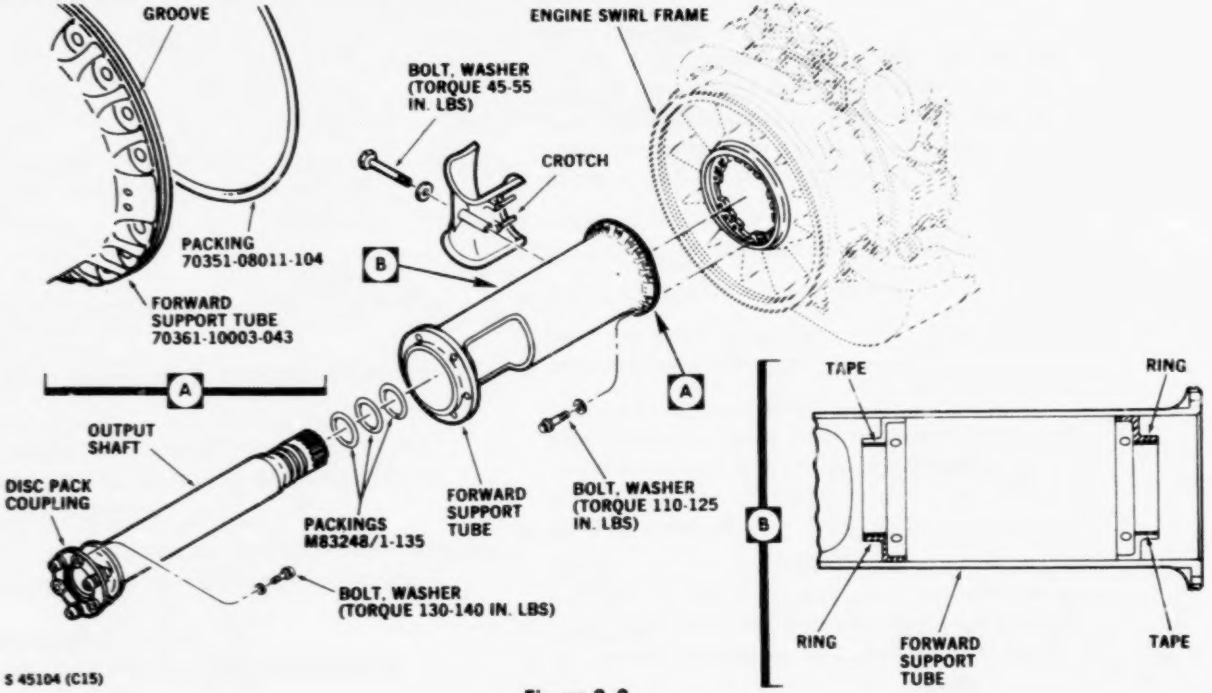

GROOVE
PACKING
70351-08011-104
FORWARD
SUPPORT TUBE
70361-10003-043
A
ENGINE SWIRL FRAME
BOLT, WASHER
(TORQUE 45-55
IN. LBS)
CROTCH
B
A
OUTPUT
SHAFT
DISC PACK
COUPLING
PACKINGS
M83248/1-135
FORWARD
SUPPORT
TUBE
BOLT, WASHER
(TORQUE 110-125
IN. LBS)
BOLT, WASHER
(TORQUE 130-140 IN. LBS)
TAPE
RING
B
RING
FORWARD
SUPPORT
TUBE
TAPE
S 45104 (C15)

Figure 2-2

STEP 2 REPLACE FORWARD SUPPORT TUBE/ENGINE OUTPUT SHAFT (CONT)

- Blend damaged area to at least 0.060-inch radius, removing least amount of material, using No. 400-grit abrasive cloth, Fed. Spec P-C-451.
- Polish blended area to remove abrasive marks and match surface smoothness using crocus cloth, Fed. Spec P-C-458.
- Clean reworked area with dry-cleaning solvent, P-D-680, Type II.
- Brush alodine reworked area (TM 55-1500-204-25/1).

NOTE

Make sure polished-out damage will not be greater than allowable limits.

INSTALL

NOTE

Packing is installed on support tube, Part No. 70361-10003-043, only.

- On helicopters with support tube, Part No. 70361-10003-043, lubricate packing, 70351-08011-104, with petrolatum, Fed. Spec VV-P-236, and install in groove on forward support tube.
- Place forward support tube, with new packing, against engine swirl frame so that cutout is outboard and shaft can be seen. Bolt forward support tube to engine swirl frame. **TORQUE BOLTS TO 110 -125 INCH-POUNDS.**
- Lubricate packings, M83248/1-135, with petrolatum, Fed. Spec VV-P-236.
- Install packings in grooves on shaft.
- Carefully slide shaft into forward support tube and engine.
- Install crotch on forward support tube engaging alignment pins. Bolt crotch to forward support tube. Shim between crotch and support tube with AN960-10L washers as required to mate crotch to engine swirl frame. **TORQUE BOLT TO 45 - 55 INCH-POUNDS.**
- Inspect work area to make certain it is clean and free of all tools and foreign matter.

STEP 2 REPLACE FORWARD SUPPORT TUBE/ENGINE OUTPUT SHAFT (CONT)

Table 2-1.

DAMAGE	DEPTH	WIDTH	LENGTH	NUMBER OF DISC
Circumferential scratches	0.005 in.	0.010 in.	360°	
Axial scratches	0.005 in.	0.010 in.	shaft full length	
Scratches on shaft	0.003 in.	0.500 in.	1.500 in.	
Nicks, gouges on shaft	0.010 in.	0.010 in.		
Nicks, gouges on flange	0.015 in.		0.125 in.	
Corrosion	0.001 in.			
Disc Pack Coupling dents and scratches	0.020 in.			no more than half
Disc Pack Coupling lamination spread		0.030 in.		no limit

STEP 2 REPLACE FORWARD SUPPORT TUBE/ENGINE OUTPUT SHAFT (CONT)

- Lower engine into engine compartment. Connect engine mounts (TASK 1).
- Deleted.
- Connect engine components to airframe (TASK 1).
- Perform engine output shaft vibration level check (STEP 3).
- Install engine air inlet (TASK 1).
- Check area to be sure it is free of foreign objects.
- Close engine cowling.
- Do an engine checkout procedure (TM 55-2840-248-23) as part of maintenance test flight.
- Do a maintenance test flight (TM 55-1520-237-MTF).
- Check DA Form 2408-13 to determine when torque check is due (TM 55-1520-237-23-4).
- Do engine output shaft inspection 1 to 3 flight hours after shaft disconnect (TM 55-1520-237-23-4).

STEP 3 ENGINE OUTPUT SHAFT VIBRATION LEVEL CHECK

- On each input module, remove one nut at rear and down from lifting ring (Figure 2.1-1).
- Install Chadwick Helmuth accelerometer, 4177B, onto P/N3383 bracket, and tighten. Install this assembly with accelerometer vertical onto input module, reinstall nut and **TORQUE TO 260 - 289 INCH-POUNDS**. Do this for both modules.
- Connect Chadwick Helmuth cables, A4296-2 to accelerometers, and route cable over top of input module, under cowl, under forward edge of engine air inlet (if inlet is installed), through tie-down ring, and in window. Do this for both No. 1 and No. 2 modules.
- Connect cable from left input module to A accelerometer input and cable from right input module to connector B input on Chadwick Helmuth balancer, 177M-6A, in helicopter.
- Connect balancer power lead to 28 vdc utility socket in crew chief's overhead panel.
- Start and run No. 1 engine at 100% N_r flat pitch. No. 2 engine must not be running.
- To measure engine output shaft vibration level of No. 1 engine output shaft, set balancer control knobs as follows:

Switch Name	Setting
Magnetic Pickup	Common
Function	A
RPM Range	X100
RPM Tune	209
Interrupter Logic	Single

- When readings stabilizes, record most recent reading in block 8 of DA Form 2408-16.

NOTE

No. 1 engine must not be running during the No. 2 shaft vibration level check.

- Shut down No. 1 engine. Start and run No. 2 engine at 100% N_r flat pitch. (No. 2 may be started while No. 1 is coasting down.)

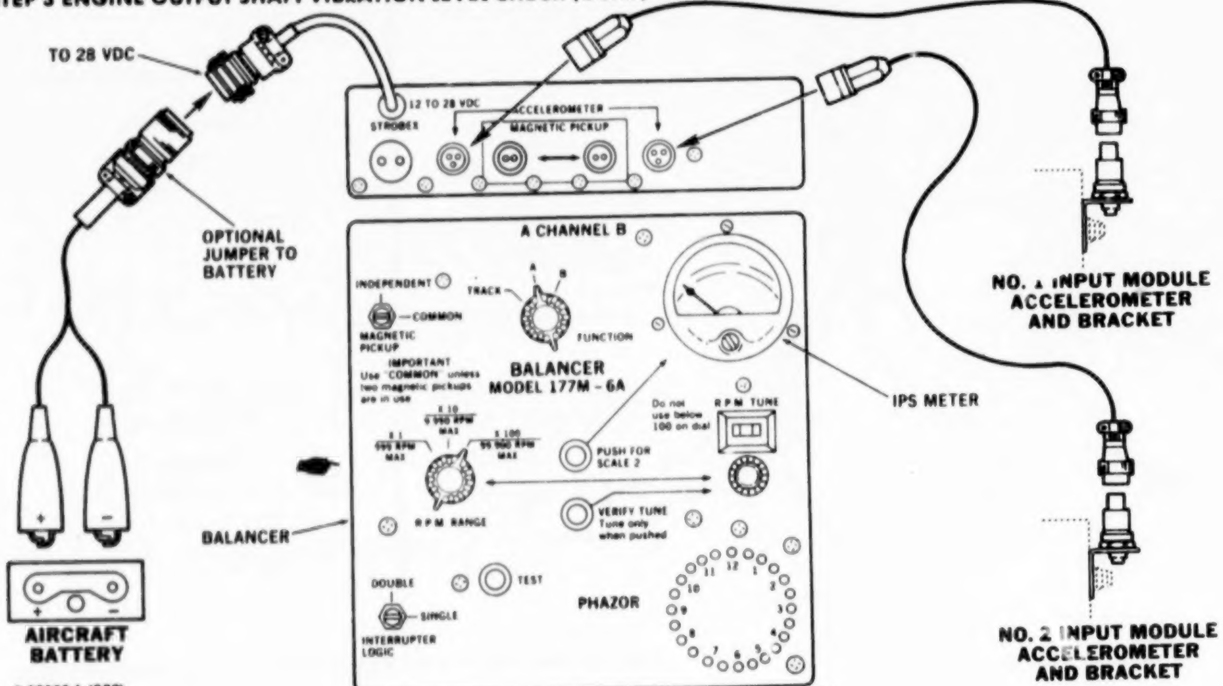
STEP 3 ENGINE OUTPUT SHAFT VIBRATION LEVEL CHECK (CONT)

- To measure engine output shaft vibration level of No. 2 engine output shaft, set balancer control knobs as follows:

Switch Name	Setting
Magnetic Pickup	Common
Function	B
RPM Range	X100
RPM Tune	209
Interrupter Logic	Single

- When readings stabilize, record most recent reading in block 8 of DA Form 2408-16.
- Shut down No. 2 engine.
- If vibration levels are less than 1.3 IPS, remove the accelerometers and brackets from input module.
- If the engine output shaft has been replaced and if the vibration level is 1.3 IPS or larger, the engine output shaft may be disconnected and rotated 120 degrees (one bolt hole) with respect to the input module flange. Reconnect the shaft in an attempt to improve the balance of the assembly. Perform the vibration check again to verify that the IPS level is less than 1.3. Three orientations are possible. If after all locations the vibration level is still 1.3 IPS or greater, replace high speed shaft, input module flange and installation hardware and repeat the procedure until the vibration level is less than 1.3 IPS.
- If the output shaft vibration level is 1.3 or larger, replace the shaft, input module flange and installation hardware.
- Replace used nuts with new MS21043-6 nuts. Caulk new nuts with sealing compound, MIL-S-8802.
- **TORQUE MS21043-6 NUTS TO 260 - 289 INCH-POUNDS.**

STEP 3 ENGINE OUTPUT SHAFT VIBRATION LEVEL CHECK (CONT)


TO 28 VDC
OPTIONAL JUMPER TO BATTERY
AIRCRAFT BATTERY
+
−
BALANCER
12 TO 28 VDC
STROBEX
ACCELEROMETER
MAGNETIC PICKUP
A CHANNEL B
INDEPENDENT
COMMON
MAGNETIC PICKUP
TRACK
A
B
FUNCTION
IMPORTANT Use "COMMON" unless two magnetic pickups are in use
BALANCER MODEL 177M - 6A
X 1 995 RPM MAX
X 10 9 950 RPM MAX
X 100 99 500 RPM MAX
R P M RANGE
PUSH FOR SCALE 2
Do not use below 100 on dial
R P M TUNE
VERIFY TUNE Tune only when pushed
TEST
DOUBLE
SINGLE
INTERRUPTER LOGIC
PHAZOR
12
1
2
3
4
5
6
7
8
9
10
11
IPS METER
NO. 1 INPUT MODULE ACCELEROMETER AND BRACKET
NO. 2 INPUT MODULE ACCELEROMETER AND BRACKET

S 82063.1 (C22)

Figure 2.1-1 (Sheet 1 of 2)

STEP 3 ENGINE OUTPUT SHAFT VIBRATION LEVEL CHECK (CONT)

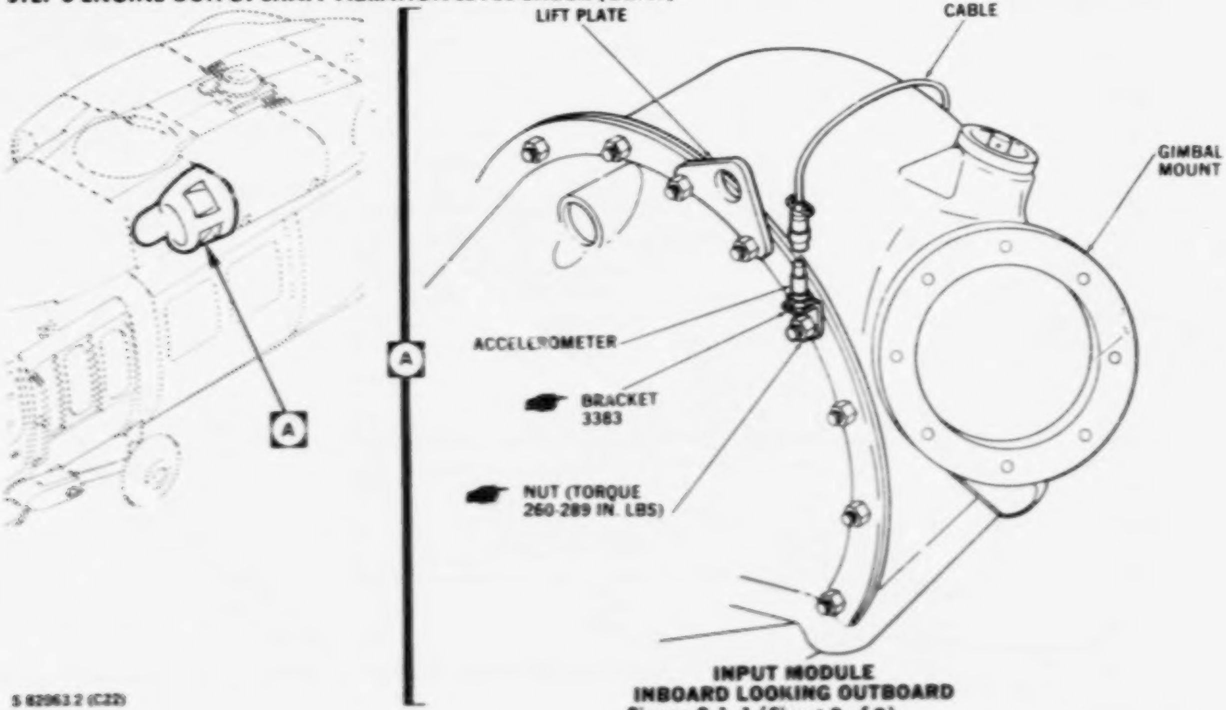
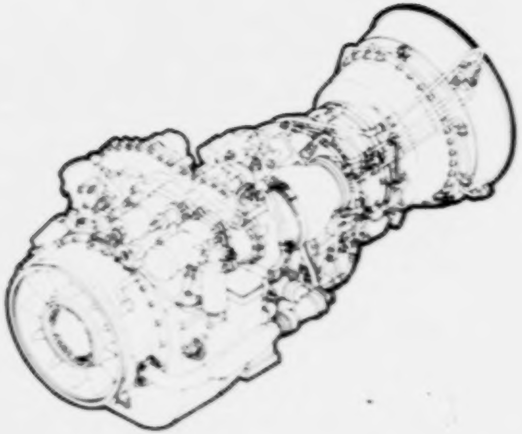

LIFT PLATE
CABLE
GIMBAL MOUNT
A
A
ACCELEROMETER
BRACKET 3383
NUT (TORQUE 260-289 IN. LBS)
INPUT MODULE
INBOARD LOOKING OUTBOARD
S 82963.2 (C22)

Figure 2.1-1 (Sheet 2 of 2)

TASK 3

ENGINE LINE REPLACEABLE UNITS (LRU's) - REPLACE

- **REMOVE LRU's - STEP 1**
- **INSTALL LRU's - STEP 2**



PERSONNEL REQUIRED

- Two People Required: MOS 68B - Aircraft Powerplant Repairer
  MOS 67T - Tactical Transport Helicopter Repairer

SUPPLIES

- As Required in T700 Maintenance Manual, TM 55-2840-248-23

TOOLS

- Aircraft Mechanic's Toolkit, NSN 5180-00-323-4692
- Engine and Powertrain Repairman's Toolkit, NSN 5180-00-323-4944

ALSO NEEDED

- TASK 1 (STEPS 1, 2)
- TASK 4 (STEP 2)
- TM 55-2840-248-23 (STEPS 1, 2)

S 45105 (B)

STEP 1 REMOVE LRU's

NOTE

The following procedures apply to both No. 1 and No. 2 engine line replaceable units.

REMOVE

- Open engine cowling.
- Turn off all electrical power.
- Remove engine line replaceable units using instructions in TM 55-2840-248-23. For other items such as lines, tubes, hoses, IPS access panels, and engine control units, use additional instructions following each LRU listed.

ACCESSORY SECTION MODULE LRU's

Particle Separator Blower. After removing pneumatic tube from starter and firewall (No. 2 engine only) and IPS duct (TASK 1).

FUEL SYSTEM LRU's

Deleted

Fuel Boost Pump. After disconnecting fuel hose from elbow, and removing elbow from pump.
Hydromechanical Control Unit (HMU). After removing engine control input assemblies and support from HMU.
Deleted
Deleted

ELECTRICAL SYSTEM LRU's

Deleted
Deleted
History Recorder. After removing access panel (No. 1 engine firewall) for removal of history recorder lower attachment bolts.
Deleted
Deleted
Deleted
Deleted
Deleted
Deleted
Deleted
Thermocouple Assembly. After removing IPS duct (TASK 1).
Deleted

STEP 1 REMOVE LRU's (CONT)

OIL SYSTEM LRU's

Deleted

Oil and Scavenge Pump. After removing left/right access panels in firewall. On No. 1 engine, disconnect main fuel line at elbow on fuel pump. Cap line and elbow.

Deleted
Deleted
Deleted
Deleted

AIR SYSTEM LRU's

Anti-Icing Bleed and Start Valve. After removing IPS blower and duct (No. 2 engine).

STEP 2 INSTALL LRU's

NOTE

The following procedures apply to both No. 1 and No. 2 engine line replaceable units.

INSTALL

- Install engine line replaceable units using instructions in TM 55-2840-248-23. For other items such as lines, tubes, hoses, IPS, access panels, and engine control units, use additional instructions following each LRU listed.

ACCESSORY SECTION MODULE LRU's

Particle Separator Blower. Install IPS duct (TASK 1) and pneumatic tube to starter and firewall.
Deleted

FUEL SYSTEM LRU's

Deleted
Fuel Boost Pump. Install elbow on pump and connect fuel hose to elbow (TASK 4.)
Hydromechanical Control Unit (HMU). Install support and engine control input assemblies on HMU.
Deleted
Deleted

ELECTRICAL SYSTEM LRU's

Deleted
Deleted
History Recorder. Install lower attachment bolts through opening in No. 1 engine firewall and install access panel on firewall in oil cooler compartment.
Deleted
Deleted
Deleted
Deleted
Deleted
Deleted
Thermocouple Assembly. Install IPS duct (TASK 1).
Deleted

STEP 2 INSTALL LRU's (CONT)

OIL SYSTEM LRU's

Deleted

Oil and Scavenge Pump. Install left/right access panels in firewall. On No. 1 engine, uncap and connect main Fuel line at elbow on Fuel pump.

Deleted

Deleted

Deleted

Deleted

Deleted

Deleted

Deleted

AIR SYSTEM LRU's

Anti-Icing Bleed and Start Valve. Install IPS blower and duct (No. 2 engine).

TASK 4

DEMOUNTABLE POWER PACKAGE - TEARDOWN/BUILDUP

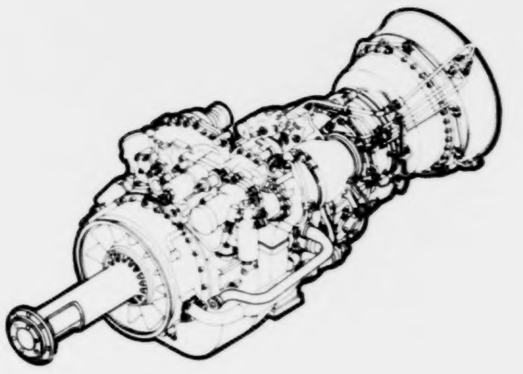
- **TEAR DOWN POWER PACKAGE - STEP 1**
- **BUILD UP POWER PACKAGE - STEP 2**
- **QUICK ENGINE CHANGE (QEC) - STEP 3**

PERSONNEL REQUIRED

- Two People Required: MOS 68B - Aircraft Powerplant Repairer
  MOS 67T - Tactical Transport Helicopter Repairer

SUPPLIES

- Antiseize Compound, MIL-A-907 (STEP 2)
- Cotter Pin, MS24665-304 (4 Required, STEP 2)
- Gasket, MS27196-12 (1 Required, STEP 2)
- Deleted
- Lubricating Oil, MIL-L-23699 (STEP 2)
- Packing, MS29512-04 (2 Required, STEP 2)
- Packing, M83248/1-135 (FSCM 81349) (3 Required, STEP 2)
- Packing, NAS 617-12 (1 Required, STEP 2)
- Packing, NAS 617-4 (4 Required, STEP 2)
- Packing, NAS 617-5 (2 Required, STEP 2)
- Packing, NAS 617-6 (1 Required, STEP 2)



S 45106 (B)

SUPPLIES (CONT)

- Packing, NAS 617-8 (1 Required, STEP 2)
- Packing, 70351-08011-104 (1 Required, STEP 2)
- Petrolatum, Fed. Spec VV-P-236 (STEP 2)

TOOLS

- Adapter, 21C7082 (FSCM 07482)
- Aircraft Mechanic's Toolkit, NSN 5180-00-323-4692
- Engine and Powertrain Repairman's Toolkit, NSN 5180-00-323-4944
- Torque Wrench, 30 - 150 inch-pounds, NSN 1520-00-542-4489 (STEP 2)

ALSO NEEDED

- TASK 5 (STEPS 1, 2)
- TM 55-2840-248-23 (STEPS 1, 2)

STEP 1 TEAR DOWN POWER PACKAGE (CONT)

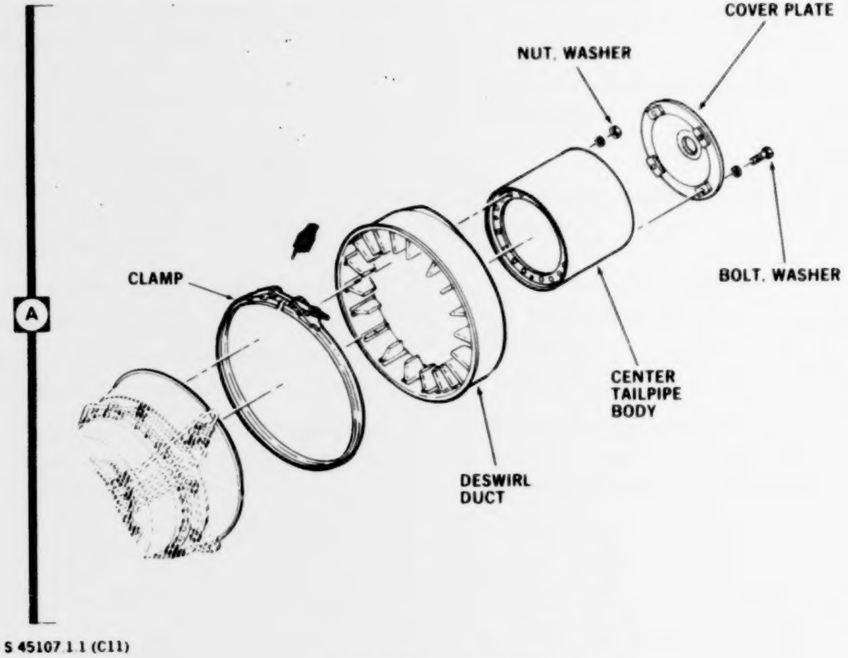

COVER PLATE
NUT, WASHER
BOLT, WASHER
CLAMP
A
CENTER TAILPIPE BODY
DESWIRL DUCT
S 45107.1.1 (C11)

Figure 4-1 (Sheet 1.1 of 3)

STEP 1 TEAR DOWN POWER PACKAGE (CONT)

- Unbolt cover plate from center tailpipe body. Remove nuts, washers, and center tailpipe body from engine exhaust.

NOTE

Rear mount links on flange under engine combustor section are removed when engine is installed on adapter, 21C7082G01, for teardown.

- Unbolt inner and outer mount links from engine rear mounting flange.
- Unbolt crotch from forward support tube. Slide crotch from forward support tube.
- Unbolt and pull forward support tube and shaft from engine. Remove packings from shaft and support tube. Discard packings.

NOTE

Packing is installed on support tube Part No. 70361-10003-043 only.

- Remove clamps and pneumatic tubes from engine bleed ports.

REMOVE WIRING HARNESS AND SENSING COMPONENTS

- Disconnect wiring harness electrical plugs from electrical control unit (ECU) and interface connector.
- Unclamp and remove wiring harness from engine.
- Disconnect engine green electrical cable connectors and remove oil temperature, oil pressure, and fuel pressure sensors from engine.

STEP 1 TEAR DOWN POWER PACKAGE (CONT)

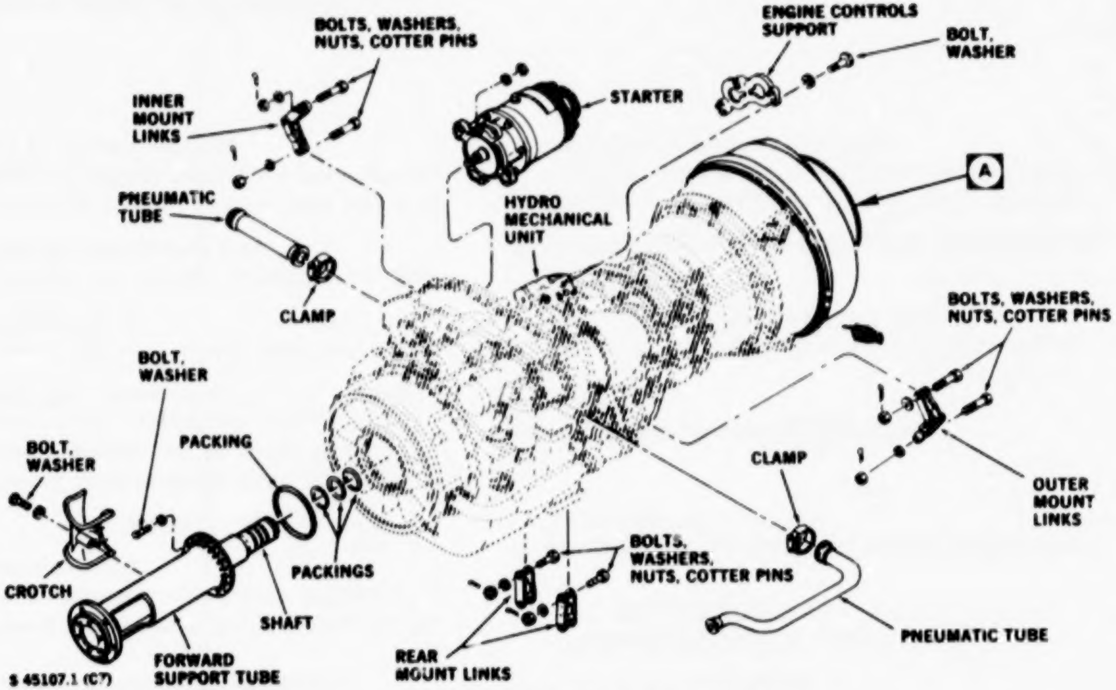
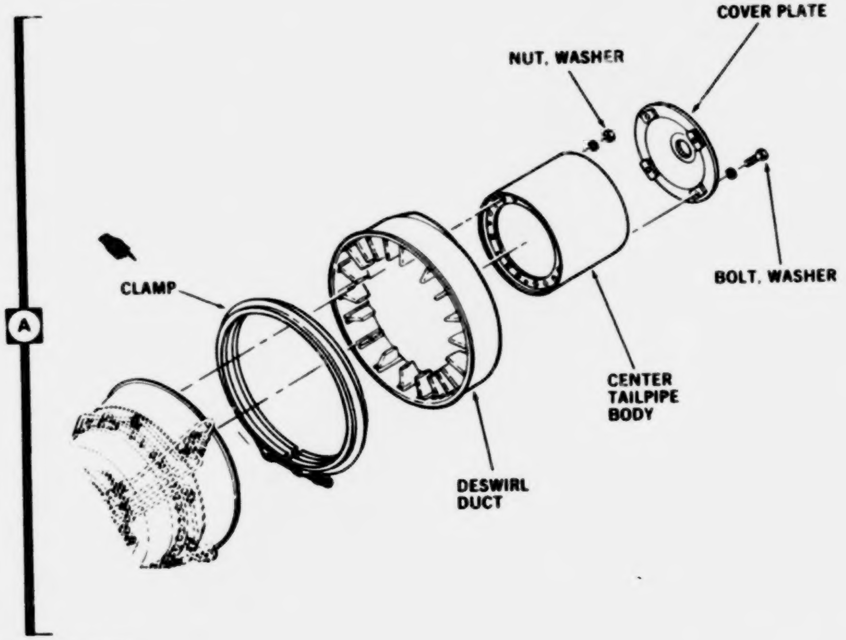

BOLTS, WASHERS, NUTS, COTTER PINS
ENGINE CONTROLS SUPPORT
BOLT, WASHER
INNER MOUNT LINKS
STARTER
A
PNEUMATIC TUBE
HYDRO MECHANICAL UNIT
CLAMP
BOLTS, WASHERS, NUTS, COTTER PINS
BOLT, WASHER
PACKING
BOLT, WASHER
CLAMP
OUTER MOUNT LINKS
CROTCH
PACKINGS
BOLTS, WASHERS, NUTS, COTTER PINS
SHAFT
PNEUMATIC TUBE
REAR MOUNT LINKS
FORWARD SUPPORT TUBE
S 45107.1 (C7)

Figure 4-1 (Sheet 1 of 3)

STEP 1 TEAR DOWN POWER PACKAGE (CONT)


COVER PLATE
NUT, WASHER
BOLT, WASHER
CLAMP
A
CENTER TAILPIPE BODY
DESWIRL DUCT

S 45107.1.1 (C7)

Figure 4-1 (Sheet 1.1 of 3)

STEP 1 TEAR DOWN POWER PACKAGE (CONT)

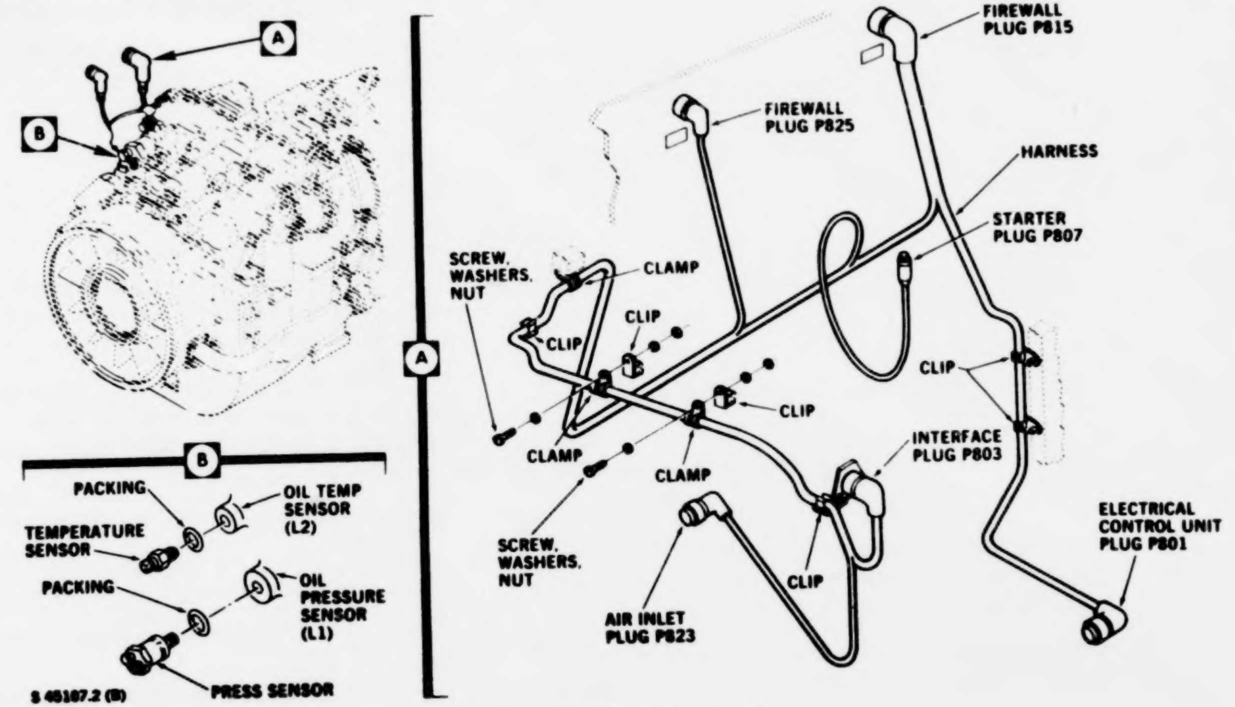

A
B
A
FIREWALL PLUG P815
FIREWALL PLUG P825
HARNESS
STARTER PLUG P807
SCREW, WASHERS, NUT
CLAMP
CLIP
CLIP
CLIP
CLIP
CLAMP
CLAMP
INTERFACE PLUG P803
ELECTRICAL CONTROL UNIT PLUG P801
SCREW, WASHERS, NUT
AIR INLET PLUG P823
CLIP
B
PACKING
OIL TEMP SENSOR (L2)
TEMPERATURE SENSOR
PACKING
OIL PRESSURE SENSOR (L1)
PRESS SENSOR
S 45107.2 (B)

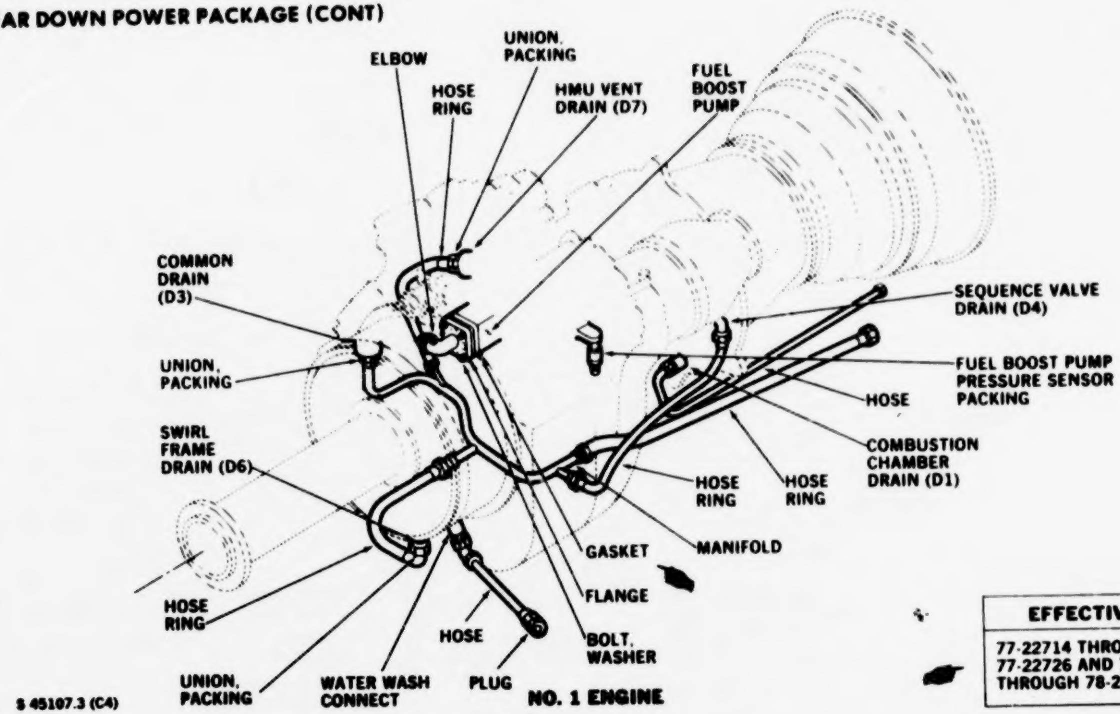
Figure 4-1 (Sheet 2 of 3)

STEP 1 TEAR DOWN POWER PACKAGE (CONT)

REMOVE FUEL AND DRAIN LINES

- Unbolt elbow from fuel boost pump and remove flange and seal from engine.
- Disconnect drain manifold from combustion chamber drain.
- Disconnect drain hose from union at gear box common drain. Remove union and packing from common drain. Remove packing from union.
- Disconnect drain hose from union at swirl frame drain. Remove union and packing from swirl frame drain. Remove packing from elbow.
- Disconnect drain hose from union at HMU vent drain. Remove union and packing from HMU vent drain.
- Disconnect drain hose from sequence valve drain. Remove manifold and drain hoses from engine.
- Remove hose from water wash port.
- Disassemble drain hoses and manifold and remove rings.
- Plug or cap engine electrical connectors and open ports.

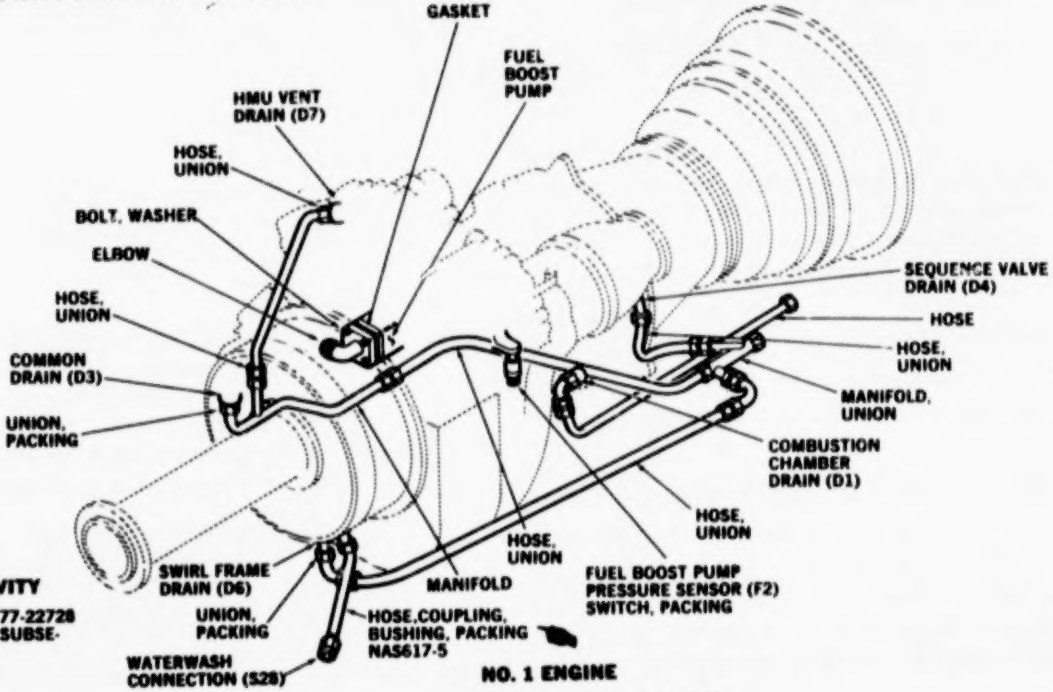
STEP 1 TEAR DOWN POWER PACKAGE (CONT)


ELBOW
UNION, PACKING
HOSE RING
HMU VENT DRAIN (D7)
FUEL BOOST PUMP
COMMON DRAIN (D3)
UNION, PACKING
SWIRL FRAME DRAIN (D6)
SEQUENCE VALVE DRAIN (D4)
FUEL BOOST PUMP PRESSURE SENSOR PACKING
HOSE
COMBUSTION CHAMBER DRAIN (D1)
HOSE RING
HOSE RING
MANIFOLD
GASKET
FLANGE
BOLT, WASHER
HOSE RING
HOSE
PLUG
UNION, PACKING
WATER WASH CONNECT
NO. 1 ENGINE
S 45107.3 (C4)

EFFECTIVITY
77-22714 THROUGH 77-22726 AND 78-22960 THROUGH 78-22962

Figure 4-1 (Sheet 2.1 of 3)

STEP 1 TEAR DOWN POWER PACKAGE (CONT)


GASKET
FUEL BOOST PUMP
HMU VENT DRAIN (D7)
HOSE, UNION
BOLT, WASHER
ELBOW
HOSE, UNION
COMMON DRAIN (D3)
UNION, PACKING
SEQUENCE VALVE DRAIN (D4)
HOSE
HOSE, UNION
MANIFOLD, UNION
COMBUSTION CHAMBER DRAIN (D1)
HOSE, UNION
HOSE, UNION
FUEL BOOST PUMP PRESSURE SENSOR (F2) SWITCH, PACKING
MANIFOLD
SWIRL FRAME DRAIN (D6)
UNION, PACKING
HOSE,COUPLING, BUSHING, PACKING NAS617-5
WATERWASH CONNECTION (S28)
S 45107.4 (C20)

EFFECTIVITY

77-22727 AND 77-22728
78-22963 AND SUBSEQUENT

NO. 1 ENGINE

Figure 4-1 (Sheet 3 of 3)

STEP 2 BUILD UP POWER PACKAGE

INSTALL FUEL AND DRAIN LINES

CAUTION

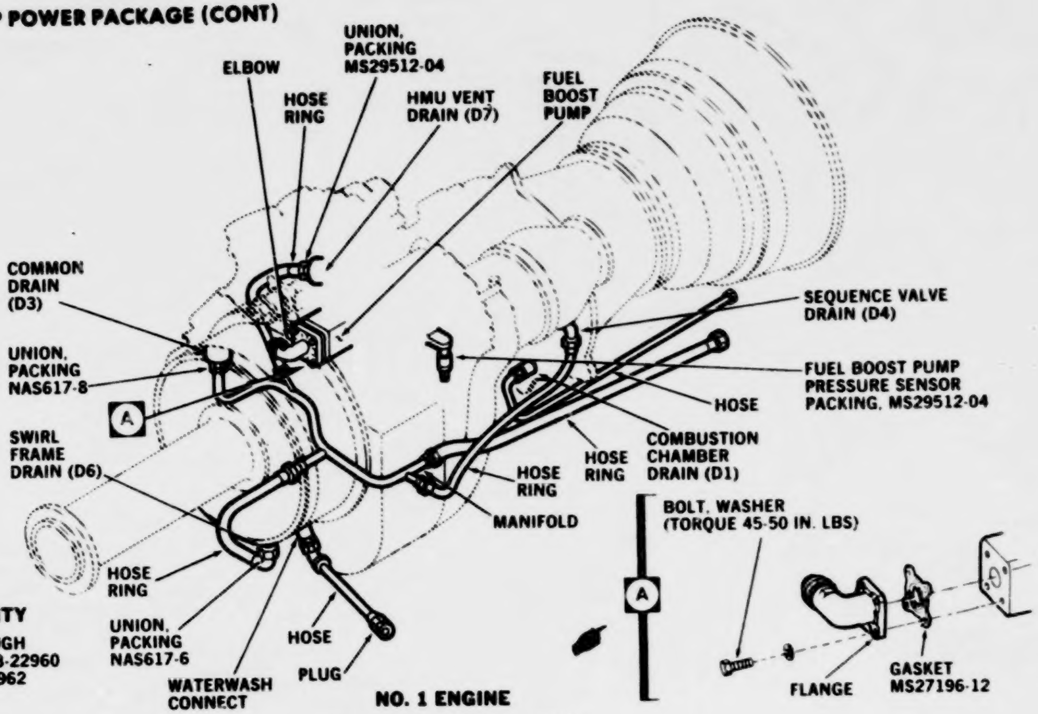
Make sure drain manifold does not chafe against engine main frame, swirl frame or scroll case. If there is chafing, loosen nuts on hoses, reposition hoses, and retighten nuts. If chafing still exists, install clamps as required to maintain hose separation.

NOTE

Hose lengths and installation for No. 1 and No. 2 engine are different. Use correct figure.

- Prevent waterwash line from chafing work platform fitting, by routing hose over anti-ice duct on No. 1 engine and over sensor tube on No. 2 engine.
- Install hose on waterwash port (TASK 1).
- Lubricate all packings with petrolatum, Fed. Spec VV-P-236.
- Coat all male threads with antiseize compound, MIL-A-907.
- Connect and install fuel and drain lines to engine as shown.
- On UH-60A helicopter serial No. 81-23547 and subsequent, and EH-60A helicopter serial No. 84-24017 and subsequent, install clamps, screw, washers, and nut between manifold and drain lines (Figure 4-2).

STEP 2 BUILD UP POWER PACKAGE (CONT)


ELBOW
UNION, PACKING MS29512-04
HOSE RING
HMU VENT DRAIN (D7)
FUEL BOOST PUMP
COMMON DRAIN (D3)
UNION, PACKING NAS617-8
A
SWIRL FRAME DRAIN (D6)
SEQUENCE VALVE DRAIN (D4)
FUEL BOOST PUMP PRESSURE SENSOR PACKING, MS29512-04
HOSE
COMBUSTION CHAMBER DRAIN (D1)
HOSE RING
HOSE RING
MANIFOLD
BOLT, WASHER (TORQUE 45-50 IN. LBS)
A
HOSE RING
UNION, PACKING NAS617-6
HOSE
PLUG
WATERWASH CONNECT
FLANGE
GASKET MS27196-12
NO. 1 ENGINE

EFFECTIVITY

77-22714 THROUGH
77-22726 AND 78-22960
THROUGH 78-22962

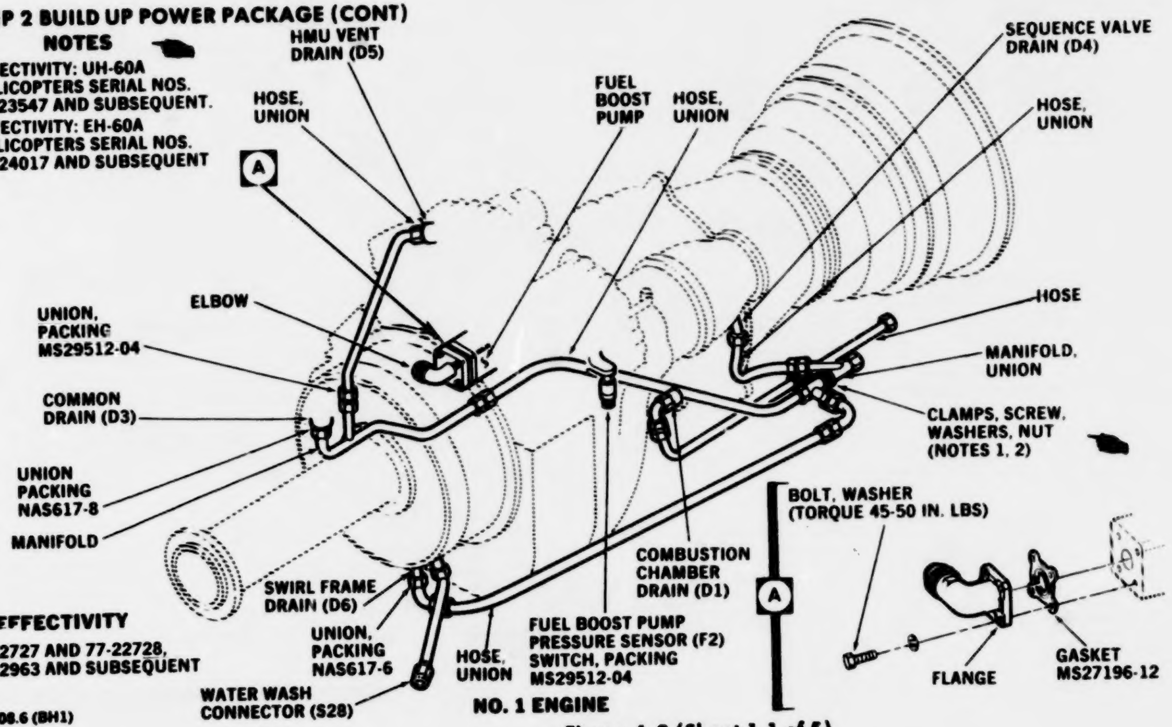
S 45108.1 (C8)

Figure 4-2 (Sheet 1 of 5)

STEP 2 BUILD UP POWER PACKAGE (CONT)

NOTES

1. EFFECTIVITY: UH-60A HELICOPTERS SERIAL NOS. 81-23547 AND SUBSEQUENT.
2. EFFECTIVITY: EH-60A HELICOPTERS SERIAL NOS. 84-24017 AND SUBSEQUENT


HMU VENT DRAIN (D5)
HOSE, UNION
A
FUEL BOOST PUMP
HOSE, UNION
SEQUENCE VALVE DRAIN (D4)
HOSE, UNION
ELBOW
UNION, PACKING MS29512-04
HOSE
MANIFOLD, UNION
COMMON DRAIN (D3)
CLAMPS, SCREW, WASHERS, NUT (NOTES 1, 2)
UNION PACKING NAS617-8
MANIFOLD
BOLT, WASHER (TORQUE 45-50 IN. LBS)
COMBUSTION CHAMBER DRAIN (D1)
A
SWIRL FRAME DRAIN (D6)
UNION, PACKING NAS617-6
HOSE, UNION
FUEL BOOST PUMP PRESSURE SENSOR (F2) SWITCH, PACKING MS29512-04
FLANGE
GASKET MS27196-12
WATER WASH CONNECTOR (S28)

EFFECTIVITY

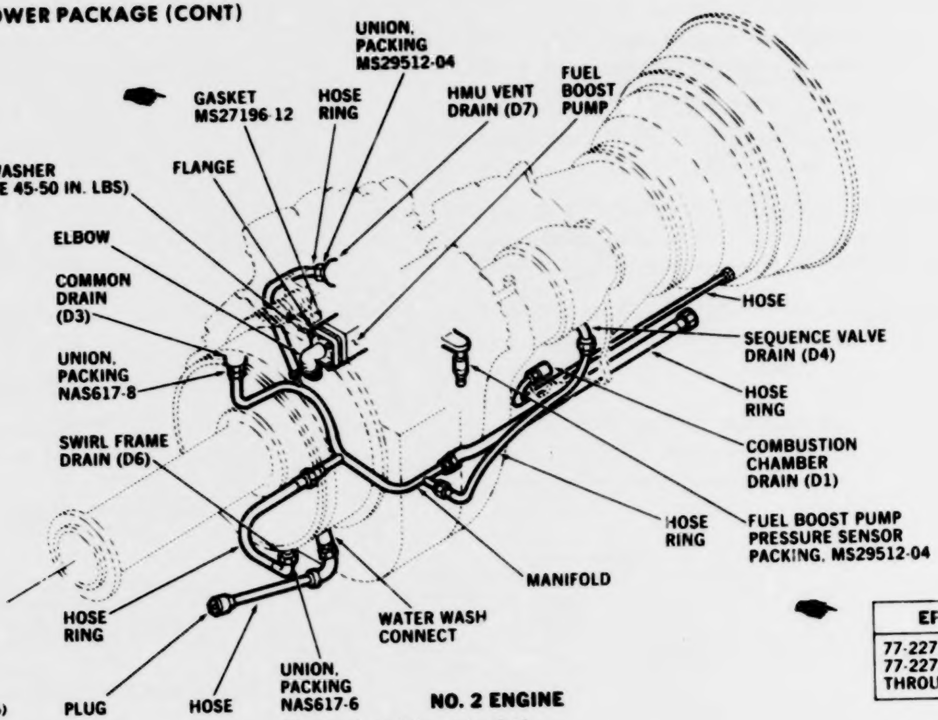
77-22727 AND 77-22728, 78-22963 AND SUBSEQUENT

S 45108.6 (BH1)

NO. 1 ENGINE

Figure 4-2 (Sheet 1.1 of 5)

STEP 2 BUILD UP POWER PACKAGE (CONT)


UNION,
PACKING
MS29512-04
GASKET
MS27196-12
HOSE
RING
HMU VENT
DRAIN (D7)
FUEL
BOOST
PUMP
BOLT, WASHER
(TORQUE 45-50 IN. LBS)
FLANGE
ELBOW
COMMON
DRAIN
(D3)
UNION,
PACKING
NAS617-8
SWIRL FRAME
DRAIN (D6)
HOSE
SEQUENCE VALVE
DRAIN (D4)
HOSE
RING
COMBUSTION
CHAMBER
DRAIN (D1)
HOSE
RING
FUEL BOOST PUMP
PRESSURE SENSOR
PACKING, MS29512-04
MANIFOLD
HOSE
RING
WATER WASH
CONNECT
UNION,
PACKING
NAS617-6
PLUG
HOSE
NO. 2 ENGINE

S 45108.2 (C4)

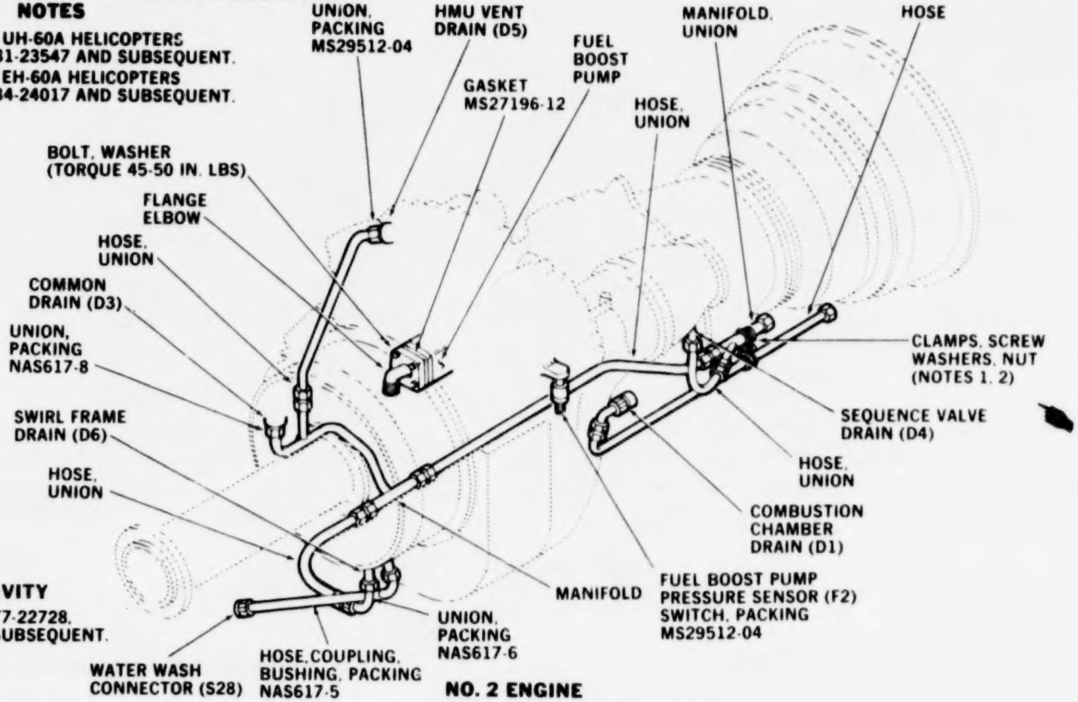
Figure 4-2 (Sheet 2 of 5)

EFFECTIVITY
77-22714 THROUGH 77-22726 AND 78-22960 THROUGH 78-22962

STEP 2 BUILD UP POWER PACKAGE (CONT)

NOTES

1. EFFECTIVITY: UH-60A HELICOPTERS SERIAL NOS 81-23547 AND SUBSEQUENT.
2. EFFECTIVITY: EH-60A HELICOPTERS SERIAL NOS 84-24017 AND SUBSEQUENT.


UNION, PACKING MS29512-04
HMU VENT DRAIN (D5)
FUEL BOOST PUMP
GASKET MS27196-12
MANIFOLD, UNION
HOSE
HOSE, UNION
BOLT, WASHER (TORQUE 45-50 IN. LBS)
FLANGE ELBOW
HOSE, UNION
COMMON DRAIN (D3)
UNION, PACKING NAS617-8
SWIRL FRAME DRAIN (D6)
HOSE, UNION
CLAMPS, SCREW WASHERS, NUT (NOTES 1, 2)
SEQUENCE VALVE DRAIN (D4)
HOSE, UNION
COMBUSTION CHAMBER DRAIN (D1)
MANIFOLD
FUEL BOOST PUMP PRESSURE SENSOR (F2) SWITCH, PACKING MS29512-04
UNION, PACKING NAS617-6
HOSE, COUPLING, BUSHING, PACKING NAS617-5
WATER WASH CONNECTOR (S28)

EFFECTIVITY

77-22727 AND 77-22728, 78-22963 AND SUBSEQUENT.

S 45108.7 (BH1)

NO. 2 ENGINE

Figure 4-2 (Sheet 2.1 of 5)

STEP 2 BUILD UP POWER PACKAGE (CONT)

INSTALL WIRING HARNESS AND SENSING COMPONENTS

NOTE

Harnesses for No. 1 and No. 2 engines are different. Use Figure 4-2 (Sheet 3 of 5) for No. 1 engine, and Figure 4-2 (Sheet 4 of 5) for No. 2 engine.

- Connect wiring harness electrical plugs to engine components as shown.
- Clamp wiring harness to engine as shown.
- Lubricate packing, NAS 617-4, with petrolatum, Fed. Spec VV-P-236. Install packing on oil temperature sensor.
- Coat threads on oil temperature sensor with antiseize compound, MIL-A-907. Install oil temperature sensor in engine accessory gear box.
- Lubricate packing, NAS 617-12, with petrolatum, Fed. Spec VV-P-236. Install packing on oil pressure sensor.
- Coat threads on oil pressure sensor with antiseize compound, MIL-A-907. Install oil pressure sensor in engine accessory gear box.
- Lubricate packing, MS29512-04, with petrolatum, Fed. Spec VV-P-236. Install packing on fuel pressure sensor.
- Coat threads on fuel pressure sensor with antiseize compound, MIL-A-907. Install fuel pressure sensor in engine accessory gear box.

STEP 2 BUILD UP POWER PACKAGE (CONT)

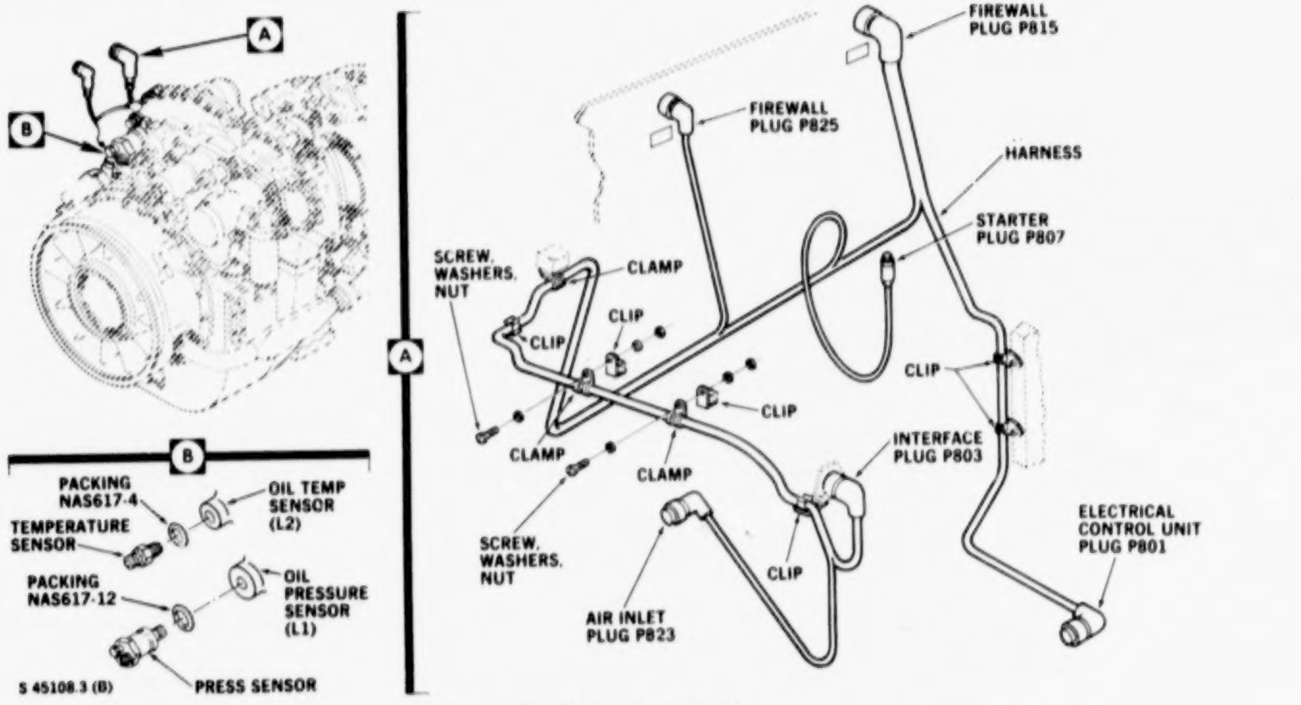

A
B
B
PACKING NAS617-4
OIL TEMP SENSOR (L2)
TEMPERATURE SENSOR
PACKING NAS617-12
OIL PRESSURE SENSOR (L1)
PRESS SENSOR
S 45108.3 (B)
A
FIREWALL PLUG P815
FIREWALL PLUG P825
HARNESS
STARTER PLUG P807
SCREW, WASHERS, NUT
CLAMP
CLIP
CLIP
CLIP
CLIP
CLAMP
CLAMP
INTERFACE PLUG P803
SCREW, WASHERS, NUT
CLIP
AIR INLET PLUG P823
ELECTRICAL CONTROL UNIT PLUG P801

Figure 4-2 (Sheet 3 of 5)

STEP 2 BUILD UP POWER PACKAGE (CONT)

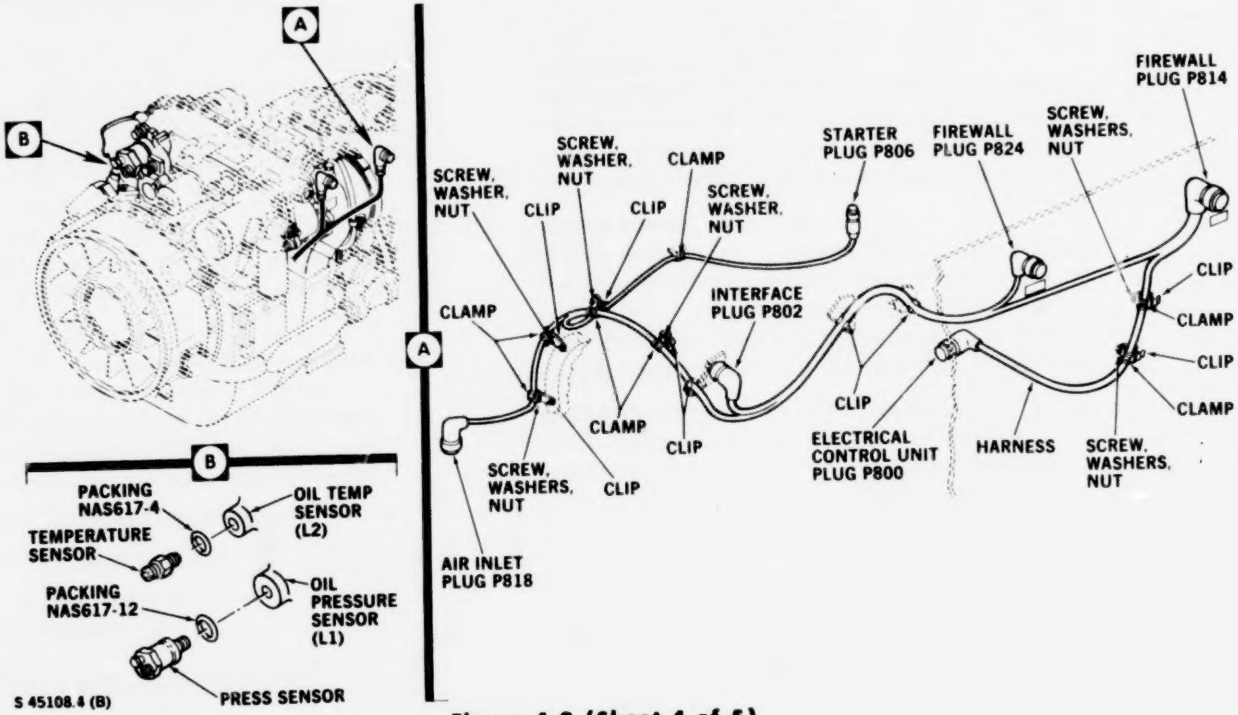

A
B
B
PACKING NAS617-4
OIL TEMP SENSOR (L2)
TEMPERATURE SENSOR
PACKING NAS617-12
OIL PRESSURE SENSOR (L1)
PRESS SENSOR
S 45108.4 (B)
A
FIREWALL PLUG P814
SCREW, WASHERS, NUT
STARTER PLUG P806
FIREWALL PLUG P824
SCREW, WASHER, NUT
CLAMP
SCREW, WASHER, NUT
CLIP
CLIP
SCREW, WASHER, NUT
INTERFACE PLUG P802
CLIP
CLAMP
CLAMP
CLIP
CLAMP
CLIP
CLAMP
CLIP
CLIP
ELECTRICAL CONTROL UNIT PLUG P800
HARNESS
SCREW, WASHERS, NUT
SCREW, WASHERS, NUT
CLIP
AIR INLET PLUG P818

Figure 4-2 (Sheet 4 of 5)

STEP 2 BUILD UP POWER PACKAGE (CONT)

INSTALL COMPONENTS

WARNING

To prevent interference and possible jamming of engine variable geometry linkage, make sure clamps are installed with clamp nuts and bolts straight up and down when connecting pneumatic tubes to engine bleed ports.

- Clamp pneumatic tubes to engine bleed ports. Position clamps with nuts forward and up. Do not tighten clamps on anti-ice pneumatic tube until installation in helicopter.
- Lubricate packings, M83248/1-135 and 70351-08011-104, with petrolatum, Fed. Spec VV-P-236. Install packings in grooves on shaft and on support tube.

NOTE

Packing is installed on support tube Part No. 70361-10003-043 only.

- Carefully slide shaft into front of engine. Place forward support tube with new packing against engine swirl frame so that cutout is outboard and shaft can be seen. Bolt tube to swirl frame. **TORQUE BOLTS TO 110 - 125 INCH-POUNDS.**
- Install crotch on forward support tube engaging alignment pins. Bolt crotch to forward support tube. Shim between crotch and support tube with AN960-10L washers as required to mate crotch to engine swirl frame. **TORQUE BOLT TO 45 - 55 INCH-POUNDS.**
- Install inner mount links to engine rear mounting flange with boltheads toward rear of engine, using washers as required under nut. **TIGHTEN EACH NUT FINGERTIGHT. ADVANCE NUT TO NEXT SLOT.** Install cotter pin, MS24665-304.

STEP 2 BUILD UP POWER PACKAGE (CONT)

- Install outer mount links to engine rear mounting flange with boltheads toward rear of engine using washers as required under nut. **TIGHTEN EACH NUT FINGERTIGHT. ADVANCE NUT TO NEXT SLOT.** Install cotter pin, MS24665-304.

NOTE

Rear mount links from flange under combustor section are to be installed after engine is removed from adapter, before installing engine in helicopter.

STEP 2 BUILD UP POWER PACKAGE (CONT)

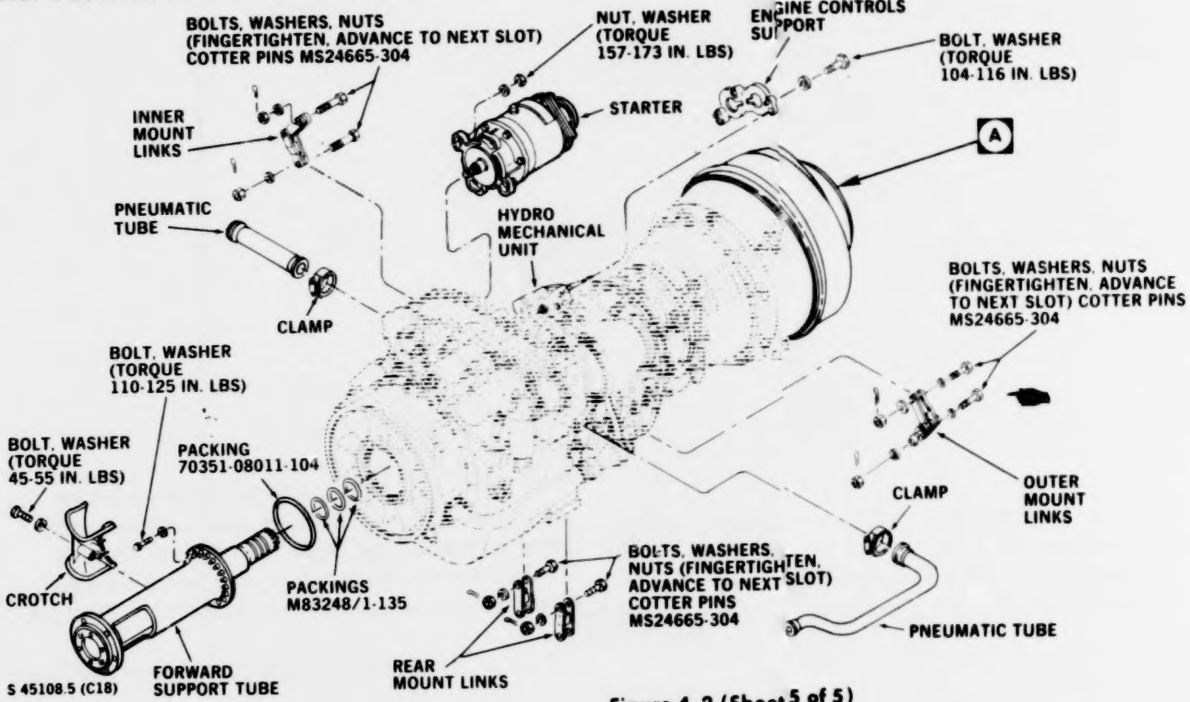
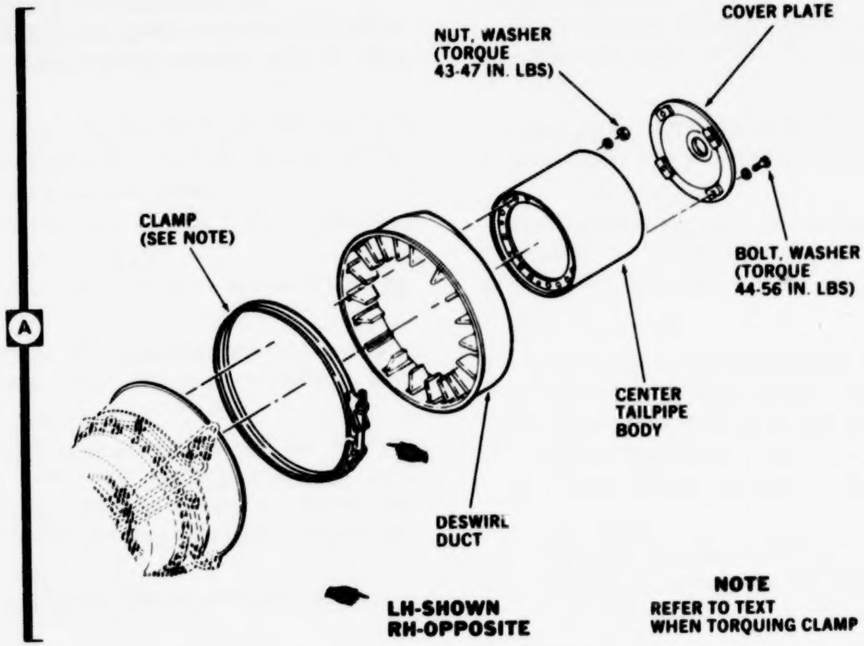

BOLTS, WASHERS, NUTS (FINGERTIGHTEN, ADVANCE TO NEXT SLOT) COTTER PINS MS24665-304
NUT, WASHER (TORQUE 157-173 IN. LBS)
ENGINE CONTROLS SUPPORT
BOLT, WASHER (TORQUE 104-116 IN. LBS)
INNER MOUNT LINKS
STARTER
A
PNEUMATIC TUBE
HYDRO MECHANICAL UNIT
CLAMP
BOLTS, WASHERS, NUTS (FINGERTIGHTEN, ADVANCE TO NEXT SLOT) COTTER PINS MS24665-304
BOLT, WASHER (TORQUE 110-125 IN. LBS)
BOLT, WASHER (TORQUE 45-55 IN. LBS)
PACKING 70351-08011-104
OUTER MOUNT LINKS
CLAMP
CROTCH
PACKINGS M83248/1-135
BOLTS, WASHERS, NUTS (FINGERTIGHTEN, ADVANCE TO NEXT SLOT) COTTER PINS MS24665-304
PNEUMATIC TUBE
FORWARD SUPPORT TUBE
REAR MOUNT LINKS
S 45108.5 (C18)

Figure 4-2 (Sheet 5 of 5)

STEP 2 BUILD UP POWER PACKAGE (CONT)


A
NUT, WASHER (TORQUE 43-47 IN. LBS)
COVER PLATE
CLAMP (SEE NOTE)
BOLT, WASHER (TORQUE 44-56 IN. LBS)
CENTER TAILPIPE BODY
DESWIRL DUCT

LH-SHOWN
RH-OPPOSITE

NOTE
REFER TO TEXT
WHEN TORQUING CLAMP

S 45108.5.1 (BH1)

Figure 4-2 (Sheet 5.1 of 5)

STEP 2 BUILD UP POWER PACKAGE (CONT)

- Clamp deswirl duct flange to engine power turbine flange as follows:
  - Make sure words LEFT ENGINE TOP LOOKING FORWARD are on top on left engine deswirl duct, and RIGHT ENGINE TOP LOOKING FORWARD are on top of right engine deswirl duct.
  - Make sure alignment hole in deswirl duct flange mates with alignment hole of power turbine module flange.
  - Lubricate pressure surfaces of clamp with lubricant, MIL-L-23699.
  - Install clamp over lips of deswirl duct and engine power turbine flange.
  - Position clamp with T-bolt at 3 o'clock for left engine and 9 o'clock for right engine with nut up.
  - Visually inspect inside deswirl duct to make sure deswirl duct flange mates with engine power turbine flange through 360°.
  - **TORQUE CLAMP TO 40 - 60 INCH-POUNDS.**
  - To seat clamp, tap it lightly with rubber or plastic hammer. Retorque clamp nut. Continue tapping until two successive trials show no loss in torque.
  - Loosen clamp nut slightly. **RETORQUE NUT TO 40 - 60 INCH-POUNDS.**
  - Visually inspect inside deswirl duct to make sure deswirl duct flange mates with engine power turbine flange through 360°.

- Install center tailpipe body, with drain hole on bottom, on engine exhaust, using washers and nuts. **TORQUE NUTS TO 43 - 47 INCH-POUNDS.**

- Bolt cover plate to center tailpipe body. **TORQUE BOLTS TO 44 - 56 INCH-POUNDS.**

- Install electrical control unit (ECU) and hydromechanical unit (HMU), using instructions in TM 55-2840-248-23.

STEP 2 BUILD UP POWER PACKAGE (CONT)

- If engine controls support is not already installed, install it on hydromechanical unit (HMU) with washers and bolts. **TORQUE BOLTS TO 104 - 116 INCH-POUNDS.**
- Install engine starter (TASK 5).

STEP 3 QUICK ENGINE CHANGE (QEC)

TEAR DOWN QUICK ENGINE CHANGE

- Remove starter from old engine (TASK 5).

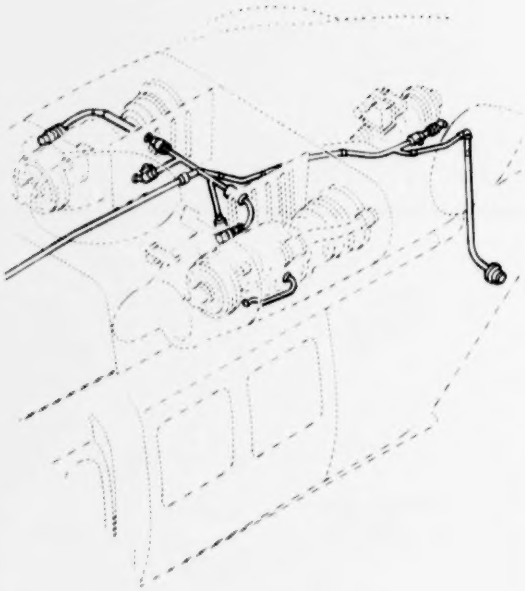
BUILDUP QUICK ENGINE CHANGE

- Install starter in new engine (TASK 5).

TASK 5

ENGINE START SYSTEM - REPLACE COMPONENTS

- **REPLACE ENGINE STARTER - STEP 1**
- **REPLACE STARTER CONTROL VALVE - STEP 2**
- **REPLACE BLEED-AIR SHUTOFF AND CHECK VALVE - STEP 3**
- **REPLACE APU CHECK VALVE - STEP 4**
- **REPLACE PNEUMATIC TUBES - STEP 5**
- **REPLACE NIPPLE-CHECK VALVE - STEP 6**
- **REPLACE STARTER SPEED SWITCH - STEP 7**



S 45109 (C2)

PERSONNEL REQUIRED

- Two People Required: MOS 67T - Tactical Transport Helicopter Repairer
  MOS 68G - Aircraft Structural Repairer (STEP 5)

SUPPLIES

- Lockwire, MS20995C20, NSN 9525-00-221-2650 (STEP 7)
- Lubricating Oil, MIL-L-23699, NSN 9150-00-180-6226 or MIL-L-7808, NSN 9150-00-782-2627 (STEP 1)
- Packing, M83248/1-151 (FSCM 81349) (STEP 1)
- Packing, S9413-018 (FSCM 99193) (STEP 1)

SUPPLIES (CONT)
- Packing, S-9413-113 (FSCM 99193) (STEP 1)
- Packing, S9413-555 (FSCM 99193) (STEP 1)
- Petrolatum, Fed. Spec VV-P-236, NSN 9150-00-250-0926 (STEP 1)
- Tube, 70306-03008-045 (STEP 5)

TOOLS
- Aircraft Mechanic's Toolkit, NSN 5180-00-323-4692
- Airframe Repairman's Toolkit, NSN 5180-00-323-4876 (STEP 5)
- Torque Wrench, 150 - 170 inch-pounds, NSN 5120-00-821-3441 (STEP 1)
- Torque Wrench, 30 - 150 inch-pounds, NSN 5120-00-542-4489 (STEPS 1, 2, 3, 4, 5, 6)

ALSO NEEDED
- TM 55-1500-204-25/1 (STEP 5)
- TM 55-1520-237-23-3 (STEPS 1, 2, 3, 4)
- TM 55-1520-237-23-5 (STEP 5)
- TM 55-2840-248-23 (STEP 1)

STEP 1 REPLACE ENGINE STARTER

NOTE

No. 1 engine starter is on inner side near firewall. No. 2 engine starter is on outer side. The following procedures apply to either starter.

REMOVE

- Turn off all electrical power.
- Open engine cowling.
- Disconnect electrical plug from connector.
- Loosen clamps on coupling end of tube at firewall.
- Unclamp tube from starter and remove tube.
- Loosen starter mounting nuts only enough to be able to turn starter, and remove starter from engine.

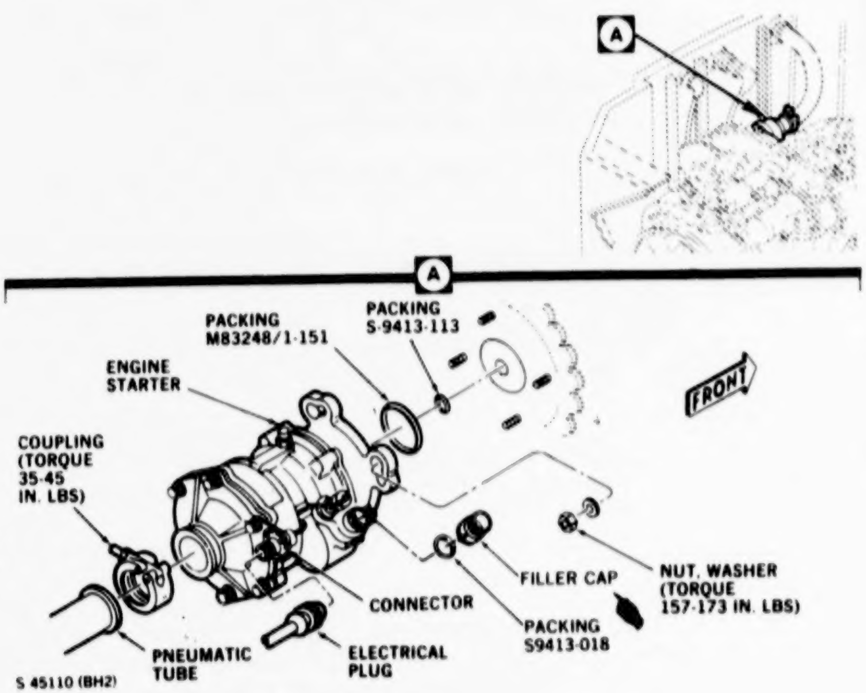

A
A
PACKING
M83248/1-151
PACKING
S-9413-113
ENGINE
STARTER
FRONT
COUPLING
(TORQUE
35-45
IN. LBS)
FILLER CAP
NUT, WASHER
(TORQUE
157-173 IN. LBS)
CONNECTOR
PACKING
S9413-018
PNEUMATIC
TUBE
ELECTRICAL
PLUG
S 45110 (BH2)

Figure 5-1

STEP 1 REPLACE ENGINE STARTER (CONT)

INSTALL

CAUTION

Roll attitude is critical during fill-to-overflow operation. Using starter vent as top dead-center, rest starter on drain plug which is bottom dead-center.

- To make sure replacement starter is properly serviced, remove drain plug from starter and drain all oil. Install packing, S9413-555, and drain plug. Remove filler cap from starter and add 190-210 cc of lubricating oil, MIL-L-23699 or MIL-L-7808, to starter. Do not mix oils. Install packing, S9413-018, and reinstall filler cap.

NOTE

- Operations at temperatures below -25°F (-34°C) will require use of MIL-L-7808 lubricating oil.
- When replacing contaminated oil, or when changing oil from one oil specification to another, use instructions per TM 55-2840-248-23.

- Turn off all electrical power.
- Lubricate packing, S-9413-113, with lubricating oil, MIL-L-23699, and install in groove on starter splined shaft.
- Lubricate packing, M83248/1-151, with petrolatum, Fed. Spec VV-P-236 and install in groove on starter mounting flange.
- Install starter on engine. **TORQUE NUTS TO 157 - 173 INCH-POUNDS.**
- Install tube between starter and firewall.
- Slide clamp from firewall end of tube over bead on end of tube. **TORQUE CLAMPS TO 35 - 45 INCH-POUNDS.**

STEP 1 REPLACE ENGINE STARTER (CONT)

- Clamp tube to starter. **TORQUE COUPLING TO 35 - 45 INCH-POUNDS.**
- Connect electrical plug to connector on starter.
- Check area to be sure it is free of foreign objects.
- Do an operational check (TM 55-1520-237-23-3).
- Close engine cowling.

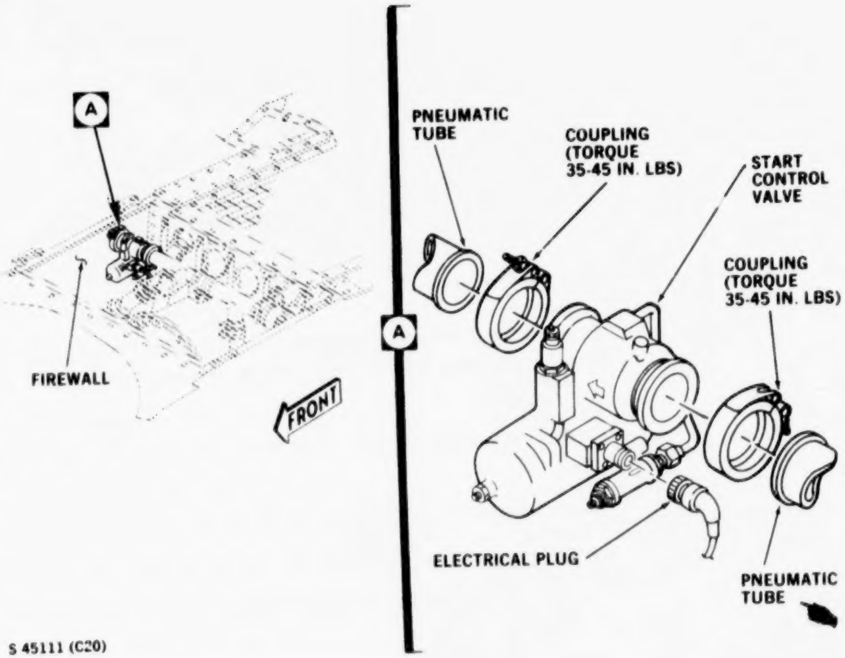
STEP 2 REPLACE STARTER CONTROL VALVE

NOTE

The following procedures apply to both No. 1 and No. 2 engine start control valves.

REMOVE

- Turn off all electrical power.
- Place main rotor blades for easy access to oil cooler compartment access doors.
- Unlatch and open oil cooler compartment access doors.
- Disconnect electrical plug from starter control valve connector.
- Disconnect couplings holding pneumatic tubes to starter control valve. Remove valve from helicopter.


A
FIREWALL
FRONT
A
PNEUMATIC TUBE
COUPLING (TORQUE 35-45 IN. LBS)
START CONTROL VALVE
COUPLING (TORQUE 35-45 IN. LBS)
ELECTRICAL PLUG
PNEUMATIC TUBE

S 45111 (C20)

Figure 5-2

STEP 2 REPLACE STARTER CONTROL VALVE (CONT)

INSTALL

CAUTION

- Be sure coupling bolts are parallel with oil cooler compartment access doors, to prevent damage to doors.
- Damage to starter control valve can result if improperly installed. Make sure there is adequate clearance between valve and oil cooler inlet line elbow.

- Place starter control valve between pneumatic tubes with directional flow arrow pointing toward engine. Connect pneumatic tubes to valve with couplings. **TORQUE TO 35 - 45 INCH-POUNDS.**
- Align clamp bolt horizontally to prevent damage to engine cowling.
- Tap around coupling with rubber mallet.
- **RETORQUE TO 35 - 45 INCH-POUNDS.**
- Continue tapping and torquing coupling until torque stabilizes.
- Connect electrical plug to connector on starter control valve.
- Check area to be sure it is free of foreign objects, then close and latch oil cooler compartment access doors.
- Deleted.
- Motor starter and check for air leaks along pneumatic lines, valves, and at starter. Motor starter to at least 25% rpm.

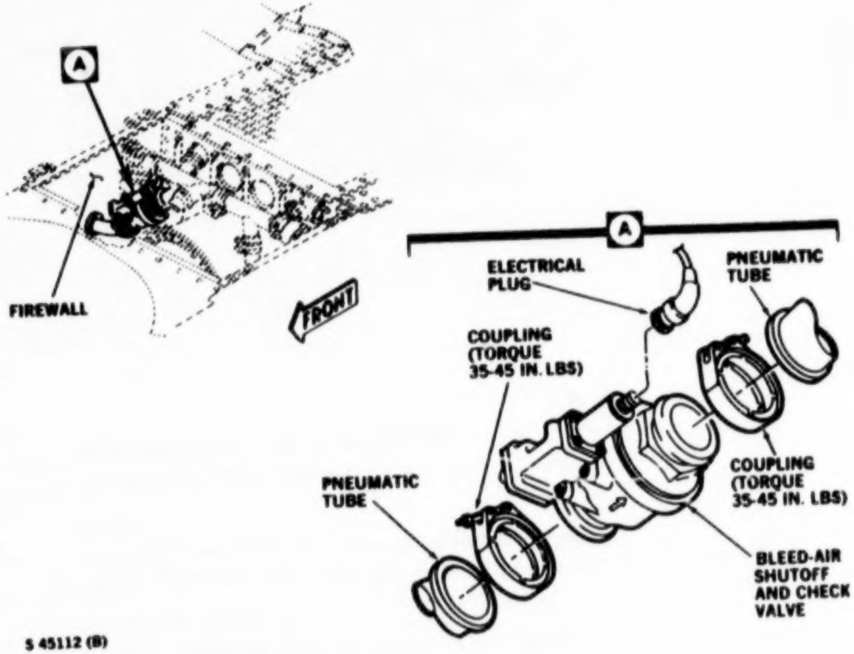
STEP 3 REPLACE BLEED-AIR SHUTOFF AND CHECK VALVE

NOTE

The following procedures apply to both No. 1 and No. 2 engine bleed air shutoff and check valves.

REMOVE

- Turn off all electrical power.
- Place main rotor blades for easy access to oil cooler compartment access doors.
- Unlatch and open oil cooler compartment access doors.
- Disconnect electrical plug from bleed air-shutoff and check valve.
- Disconnect couplings holding pneumatic tubes to bleed-air shutoff and check valve. Remove valve from helicopter.


A
FIREWALL
FRONT
A
ELECTRICAL PLUG
PNEUMATIC TUBE
COUPLING (TORQUE 35-45 IN. LBS)
PNEUMATIC TUBE
COUPLING (TORQUE 35-45 IN. LBS)
BLEED-AIR SHUTOFF AND CHECK VALVE

S 45112 (B)

Figure 5-3

STEP 3 REPLACE BLEED-AIR SHUTOFF AND CHECK VALVE (CONT)

INSTALL

- Turn off all electrical power.
- Place bleed-air shutoff and check valve between pneumatic tubes with directional arrow pointing away from firewall. Connect pneumatic tubes to valve with couplings. **TORQUE TO 35 - 45 INCH-POUNDS.**
- Connect electrical plug to connector on bleed-air shutoff and check valve.
- Check area to be sure it is free of foreign objects, then close and latch oil cooler compartment access doors.
- Do an operational check (TM 55-1520-237-23-3) to be sure check valve is not leaking.

STEP 4 REPLACE APU CHECK VALVE

REMOVE

- Shut off all electrical power.
- Hinge open APU compartment door.
- Loosen clamps on coupling and slide clamps on pneumatic tube. Discard coupling.
- Disconnect coupling holding check valve to pneumatic tube. Remove valve from helicopter.

INSPECT

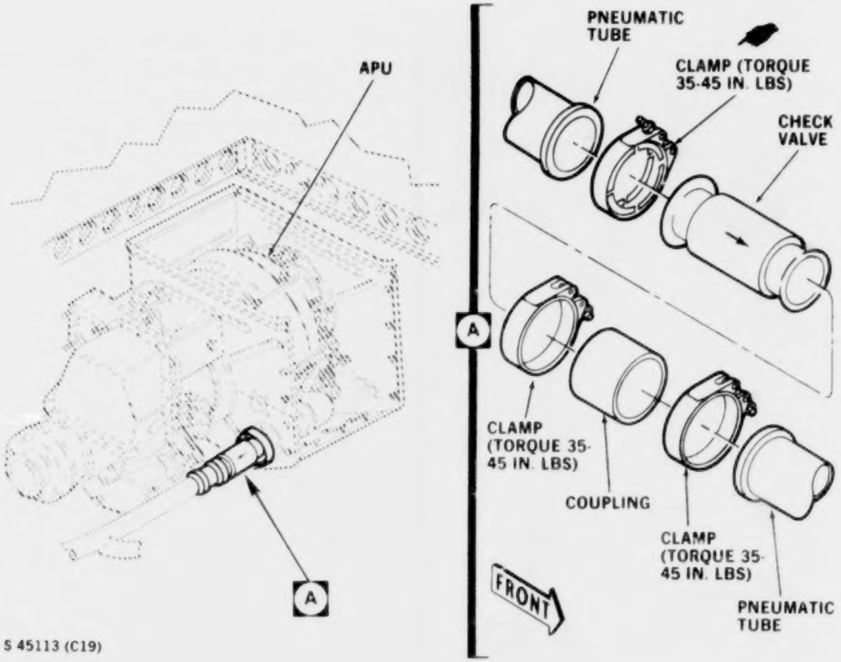
- **DENTS TOTALING UP TO A 5% TUBE AREA REDUCTION ARE ACCEPTABLE.**
- **NO ONE DENT TO EXCEED 1/8 INCH DEPTH.**

STEP 4 REPLACE APU CHECK VALVE (CONT)

- **REPLACE TUBES WITH ANY CRACKS AT WELD JOINTS.**
- **REPLACE RUBBER COUPLINGS IF TOO STIFF TO SLIDE OVER TUBE, OR IF CHAFED, TORN, OR OTHERWISE DAMAGED.**

INSTALL

- Place check valve between pneumatic tubes with directional arrow pointing towards front of helicopter. Connect pneumatic tube to valve with coupling. **TORQUE COUPLING TO 35 - 45 INCH-POUNDS.**
- Slide new coupling and clamps onto check valve. Place clamps next to beads on valve and pneumatic tube. **TORQUE CLAMPS TO 35 - 45 INCH-POUNDS.**
- Check area to be sure it is free of foreign objects.
- Close and latch APU compartment door.
- Do an operational check (TM 55-1520-237-23-3) to be sure check valve is not leaking.


APU
A
A
PNEUMATIC TUBE
CLAMP (TORQUE 35-45 IN. LBS)
CHECK VALVE
CLAMP (TORQUE 35-45 IN. LBS)
COUPLING
CLAMP (TORQUE 35-45 IN. LBS)
PNEUMATIC TUBE
FRONT

S 45113 (C19)

Figure 5-4

STEP 5 REPLACE PNEUMATIC TUBES

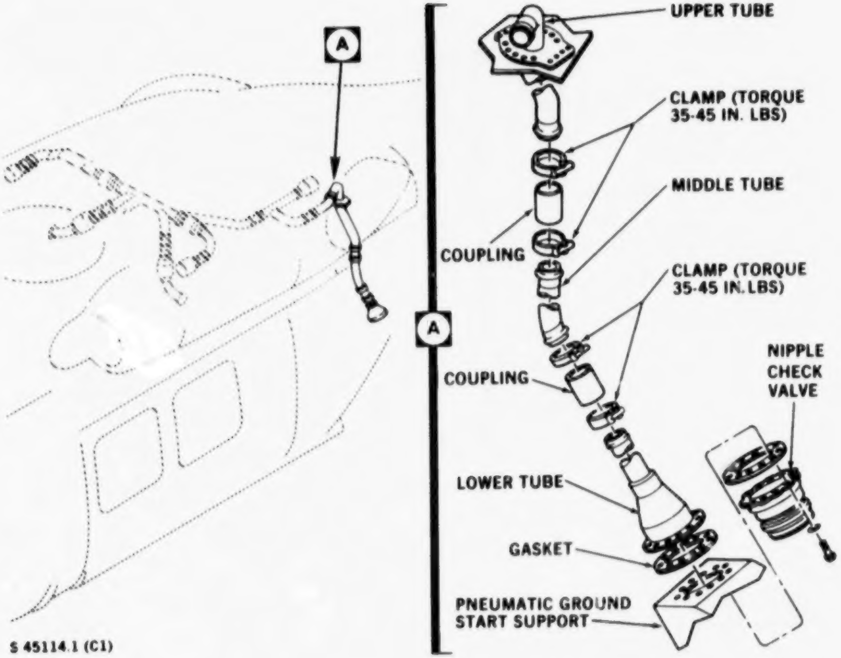
REPLACE TUBES IN TRANSITION SECTION

REMOVE

- Remove nipple-check valve (STEP 6).
- Remove troop seats from midsection rear cabin (TM 55-1520-237-23-5).
- Remove soundproofing blanket from left stowage compartment in cabin midsection.
- Unhook cargo netting to get to compartment and tail cone.
- Inside transition section, loosen clamps on couplings and remove tubes.

INSPECT

- **DENTS UP TO 25% OF TUBE DIAMETER ARE ACCEPTABLE.**
- **REPLACE TUBES WITH ANY CRACKS AT WELD JOINTS.**


A
A
UPPER TUBE
CLAMP (TORQUE 35-45 IN. LBS)
MIDDLE TUBE
COUPLING
CLAMP (TORQUE 35-45 IN.LBS)
COUPLING
NIPPLE CHECK VALVE
LOWER TUBE
GASKET
PNEUMATIC GROUND START SUPPORT

S 45114.1 (C1)

Figure 5-5 (Sheet 1 of 4)

STEP 5 REPLACE PNEUMATIC TUBES

- **REPLACE RUBBER COUPLINGS IF TOO STIFF TO SLIDE OVER TUBE, OR IF CHAFED, TORN, OR OTHERWISE DAMAGED.**

INSTALL

- Inside transition section connect middle tube to upper tube with serviceable coupling and clamps. Place clamps next to bead on each tube. **TORQUE TO 35 -45 INCH-POUNDS.**

STEP 5 REPLACE PNEUMATIC TUBES (CONT)

- Connect lower tube to middle tube with coupling and clamps. Place clamps next to bead on each tube. **TORQUE TO 35 - 45 INCH-POUNDS.**
- Place gasket between lower tube and pneumatic ground start support.
- Install nipple-check valve (STEP 6).
- Check area to be sure it is free of foreign objects, then hook cargo netting in left stowage compartment openings. Install soundproofing blanket.
- Install troop seats (TM 55-1520-237-23-5).

REPLACE TUBES IN APU COMPARTMENT

REMOVE

- Remove APU compartment door and fairings (TM 55-1520-237-23-5).
- Unclamp front tube from APU check valve.
- Loosen clamps on couplings and remove front and rear tubes from compartment. Discard couplings.

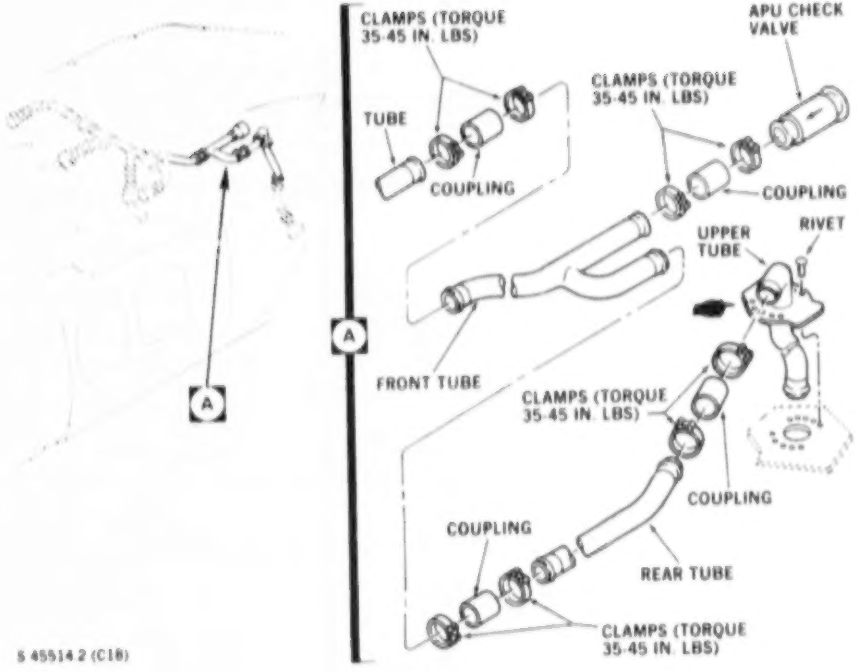

A
CLAMPS (TORQUE 35-45 IN. LBS)
TUBE
COUPLING
APU CHECK VALVE
CLAMPS (TORQUE 35-45 IN. LBS)
COUPLING
UPPER TUBE
RIVET
A
FRONT TUBE
CLAMPS (TORQUE 35-45 IN. LBS)
COUPLING
COUPLING
REAR TUBE
CLAMPS (TORQUE 35-45 IN. LBS)
S 45514.2 (C18)

Figure 5-5 (Sheet 2 of 4)

STEP 5 REPLACE PNEUMATIC TUBES (CONT)

- Remove rivets (TM 55-1500-204-25/1) from upper tube and remove tube.

INSTALL

- Position rear tube on airframe with mounting holes lined up, and install MS20470AD rivets (TM 55-1500-204-25/1).
- Connect rear tube to upper tube with new coupling and clamps. Place clamps next to bead on each tube. **TORQUE TO 35 - 45 INCH-POUNDS.**
- Clamp front tube to check valve with new coupling and clamps. Place clamps next to bead on valve and tube. **TORQUE TO 35 - 45 INCH-POUNDS.**
- Connect front tube to rear tube and oil cooler compartment tube with new couplings, 710043-1.50-011, and clamps. Place clamps next to bead on each tube. **TORQUE TO 35 - 45 INCH-POUNDS.**
- Check area to be sure it is free of foreign objects; then install APU compartment fairings and door (TM 55-1520-237-23-5).

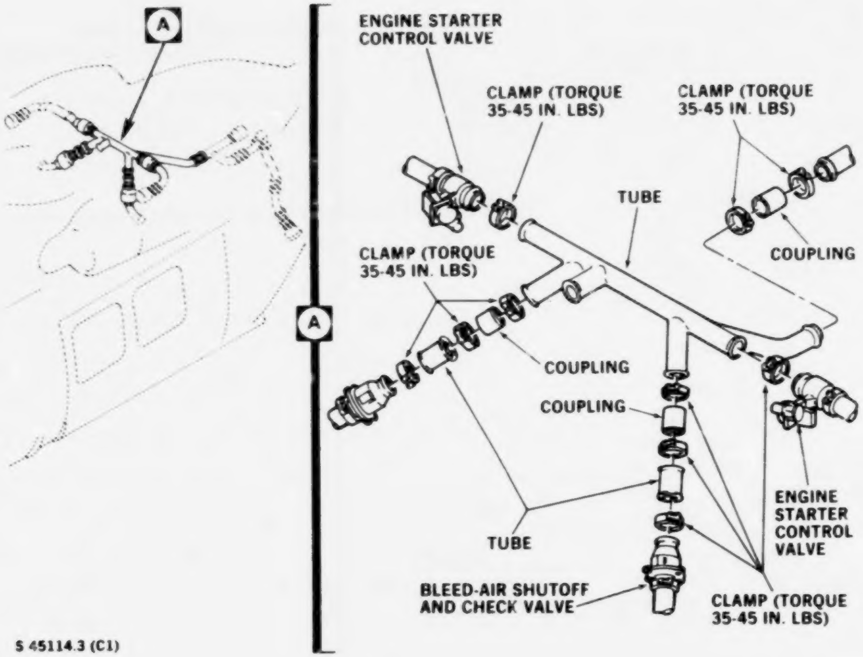

A
A
ENGINE STARTER CONTROL VALVE
CLAMP (TORQUE 35-45 IN. LBS)
CLAMP (TORQUE 35-45 IN. LBS)
TUBE
COUPLING
CLAMP (TORQUE 35-45 IN. LBS)
COUPLING
COUPLING
ENGINE STARTER CONTROL VALVE
TUBE
BLEED-AIR SHUTOFF AND CHECK VALVE
CLAMP (TORQUE 35-45 IN. LBS)
S 45114.3 (C1)

Figure 5-5 (Sheet 3 of 4)

STEP 5 REPLACE PNEUMATIC TUBES (CONT)

REPLACE TUBES IN OIL COOLER COMPARTMENT

REMOVE

- Place main rotor blades for easy access to oil cooler compartment access doors.
- Remove oil cooler compartment access doors (TM 55-1520-237-23-5).
- Unclamp tube and couplings from bleed-air shutoff and check valves and engine starter control valves. Discard couplings.
- Loosen clamps on couplings of APU compartment tube and remove tube from compartment. Discard couplings.

INSTALL

- Clamp tubes to bleed-air shutoff and check valves and engine starter control valves.
- Connect tube to APU compartment tube with new coupling, 710043-1.50-11, and clamps. Place clamps next to bead on each tube. **TORQUE TO 35 - 45 INCH-POUNDS.**
- Check area to be sure it is free of foreign objects, then install oil cooler compartment doors (TM 55-1520-237-23-5).

REPLACE TUBES IN ENGINE COMPARTMENTS

REMOVE

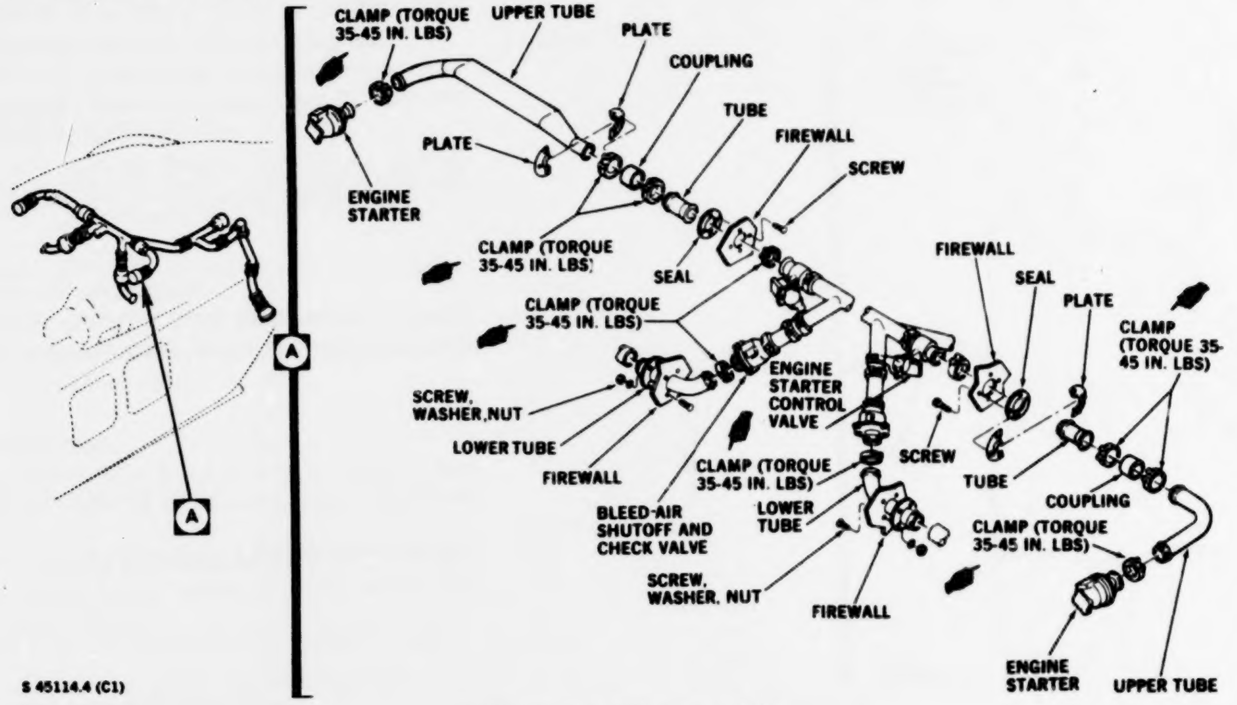
- Open engine cowling.
- Remove oil cooler compartment access doors (TM 55-1520-237-23-5).
- Remove screws and plates from firewall.
- Unclamp upper tube and coupling from engine starter and engine starter control valve. Discard coupling.
- Remove starter control valve (STEP 2).
- Remove screws, plate, seal and tube from firewall.
- Unclamp lower tube from bleed-air shutoff and check valve and engine bleed-air tube.
- Remove screws and remove tube from firewall.

STEP 5 REPLACE PNEUMATIC TUBES (CONT)

INSTALL

- Install lower tubes on firewall with screws, washers, and nuts.
- Clamp tube to bleed-air shutoff and check valve. Connect tube to engine bleed-air tube with new coupling, 710043-1.50-11, and clamps. Place clamps next to bead on each tube. **TORQUE TO 35 - 45 INCH-POUNDS.**
- Install upper tube on firewall with seals, plates, and screws.
- Install starter control valve (STEP 2).
- Clamp tube and new coupling, 710043-1.50-11, to engine starter and engine starter control valve. **TORQUE CLAMPS TO 35 - 45 INCH-POUNDS.**
- Install oil cooler compartment access doors (TM 55-1520-237-23-5).
- Check area to be sure it is free of foreign objects, then close engine cowling and latch.

STEP 5 REPLACE PNEUMATIC TUBES (CONT)


A
A
CLAMP (TORQUE 35-45 IN. LBS)
UPPER TUBE
PLATE
COUPLING
TUBE
FIREWALL
SCREW
PLATE
ENGINE STARTER
CLAMP (TORQUE 35-45 IN. LBS)
SEAL
CLAMP (TORQUE 35-45 IN. LBS)
SCREW, WASHER, NUT
LOWER TUBE
FIREWALL
BLEED-AIR SHUTOFF AND CHECK VALVE
ENGINE STARTER CONTROL VALVE
CLAMP (TORQUE 35-45 IN. LBS)
LOWER TUBE
SCREW, WASHER, NUT
FIREWALL
SCREW
FIREWALL
SEAL
PLATE
CLAMP (TORQUE 35-45 IN. LBS)
TUBE
COUPLING
CLAMP (TORQUE 35-45 IN. LBS)
ENGINE STARTER
UPPER TUBE

S 45114.4 (C1)

Figure 5-5 (Sheet 4 of 4)

STEP 6 REPLACE NIPPLE-CHECK VALVE

REMOVE

- Open access panel.
- Using grease pencil, mark flange on nipple and support bracket for proper alignment at re-installation.
- Unbolt and remove nipple-check valve and gasket from pneumatic ground start support and pneumatic tube.

INSPECT

- **REPLACE NIPPLE ONLY AFTER TROUBLESHOOTING INDICATES MALFUNCTION, OR IF THERE IS VISIBLE DAMAGE OR DISTORTION.**

INSTALL

- Place gasket on nipple-check valve flange and place and line up gasket and flange against pneumatic ground start support.
- Fasten flange gasket and pneumatic ground start support to pneumatic tube with bolts and washers. **TORQUE BOLTS TO 104 - 116 INCH-POUNDS.**
- Check area to be sure it is free of foreign objects and close access panel.

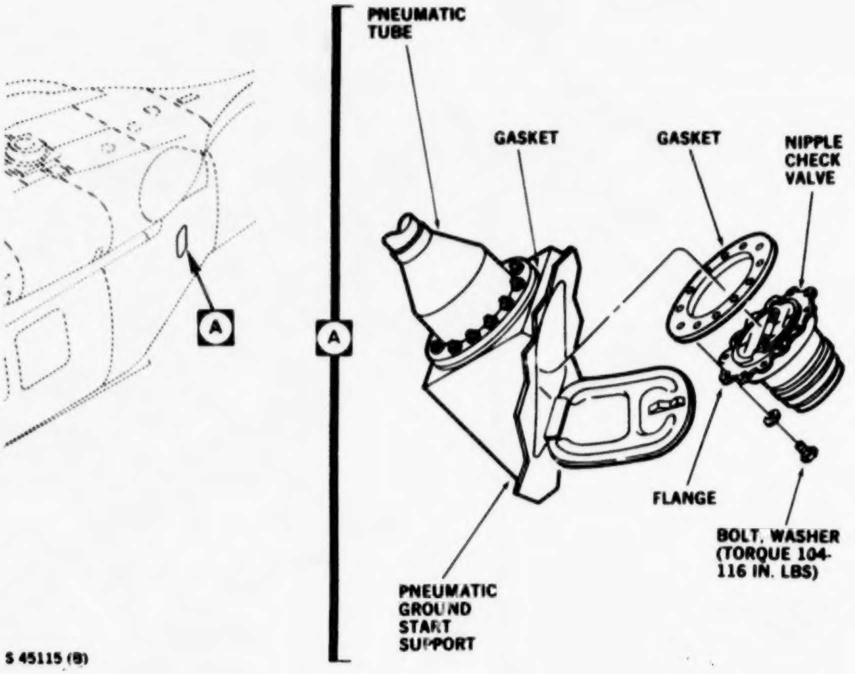

PNEUMATIC TUBE
GASKET
GASKET
NIPPLE CHECK VALVE
A
A
FLANGE
BOLT, WASHER (TORQUE 104-116 IN. LBS)
PNEUMATIC GROUND START SUPPORT
S 45115 (B)

Figure 5-6

STEP 7 REPLACE STARTER SPEED SWITCH

REMOVE

- Turn off all electrical power.
- Remove screws and hinge down soundproofing from left cabin ceiling at BL 18 and STA 285.
- Disconnect electrical connector from starter speed switch.
- Remove two screws and remove starter speed switch from cabin ceiling.

INSTALL

- Turn off all electrical power.
- Place switch on cabin ceiling and secure with two screws.
- Plug electrical connector into starter speed switch.
- Check area to be sure it is free of foreign objects.
- Install soundproofing.

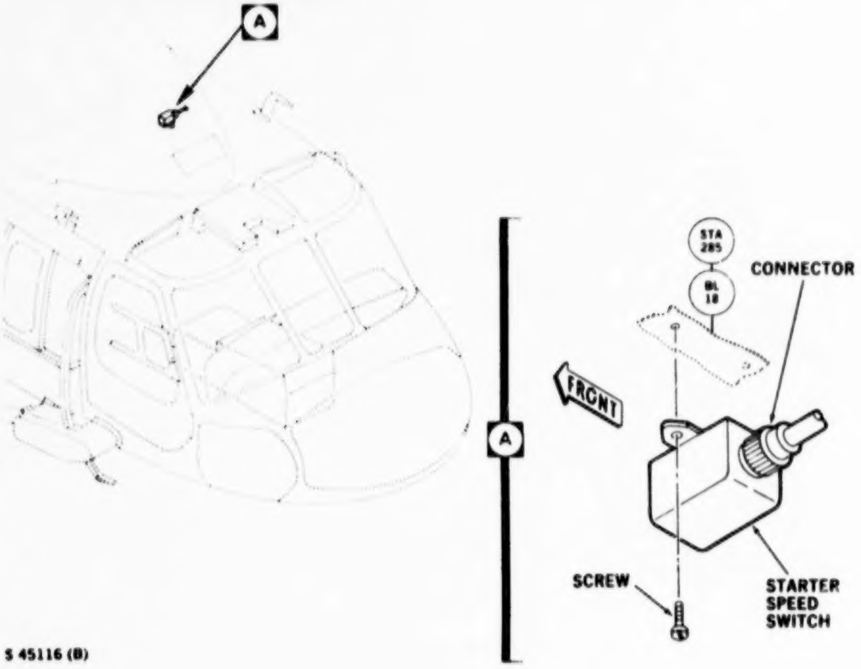

A
STA 285
BL 18
CONNECTOR
FRONT
A
SCREW
STARTER SPEED SWITCH
S 45116 (B)

Figure 5-7

TASK 6

ENGINE CONTROL QUADRANT - MAINTAIN

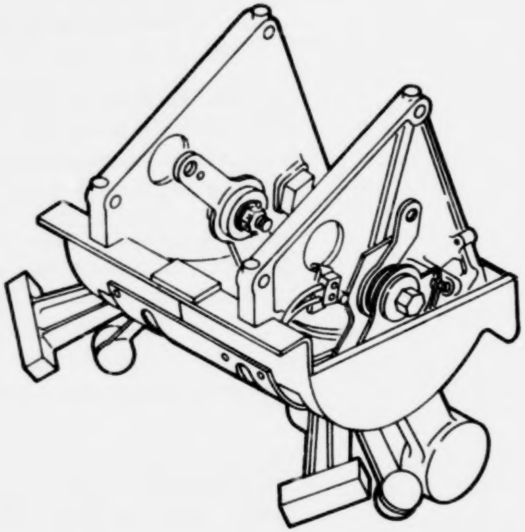
- **REPLACE QUADRANT - STEP 1**
- **REPLACE FIRE EXTINGUISHER T-HANDLE LAMP - STEP 2**

PERSONNEL REQUIRED
- One Person Required: MOS 67T - Tactical Transport Helicopter Repairer

SUPPLIES
- Cotter Pin, MS24665-155 (2 Required, STEP 1)
- Sealing Compound, MIL-S-8802, NSN 8030-00-753-5008 (STEP 1)

TOOLS
- Aircraft Mechanic's Toolkit, NSN 5180-00-323-4692
- 0.125-inch-diameter drill rod (5 inches long) (STEP 1)

ALSO NEEDED
- TM 55-1520-237-23-3 (STEPS 1, 2)
- TM 55-1520-237-23-9 (STEP 1)



S 45118 (B)

STEP 1 REPLACE QUADRANT

REMOVE

NOTE

The following procedures apply to both No. 1 and No. 2 quadrants.

- Disconnect battery (TM 55-1520-237-23-9).
- Turn off all electrical power.
- Move fuel selector levers forward.
- Unlock fastener studs holding upper console to cockpit overhead, and hinge down upper console. Remove screws and bracket at rear of quadrant.
- On helicopters prior to serial No. 85-24462 not modified by MWO 55-1520-237-50-20: Remove center and side covers from quadrant. Remove stopbolt.
- On helicopters serial No. 85-24462 and subsequent, or helicopters modified by MWO 55-1520-237-50-20, do this:
  - Remove screws and washers from center cover, and remove cover before disconnecting electrical connector (MS90335-1) from receptacle on right side cover.
  - Remove screws and washers from left side cover, lower cover and disconnect electrical connector (P394). Remove stopbolt.
  - Remove screws and washers from right side cover, lower cover and disconnect electrical connectors (P395 and P396). Remove stopbolt.
- Unbolt control cables from quadrant levers.
- Remove clamp and disconnect electrical connector P105 (No. 1 quadrant) or P106 (No. 2 quadrant).
- Unbolt and remove quadrant from canopy.

STEP 1 REPLACE QUADRANT (CONT)

INSTALL

CAUTION

To avoid damage to the starter switch actuators, while depressing starter button, DO NOT move ENG POWER CONT lever from FLY or IDLE positions to OFF.

- Turn off all electrical power.
- Bolt quadrant to cockpit upper canopy with washers and bolts. **TORQUE BOLTS TO 104 - 116 INCH-POUNDS.**
- Connect electrical connector P105 (No. 1 quadrant) or P106 (No. 2 quadrant). Install clamp around connector and secure with screw, washer, and nut.
- Move ENG POWER CONT lever so rigging holes in lever and plate line up. Insert 0.125-inch-diameter drill rod through rigging holes in lever and plate.
- Disconnect power-available rotary input from engine hydromechanical unit (HMU) (TASK 7). Insert 0.125-inch-diameter drill rod through rigging hole in outer housing and inner rotary driver of rotary input. Place rotary input next to HMU.
- Adjust rod end on power-available push/pull control cable until rod end bearing and quadrant ENG POWER CONT lever holes line up and tighten jamnut 1/6 - 1/3 turn past point where sharp rise in torque is felt. Bolt quadrant lever to control cable. **TORQUE NUT TO 30 - 50 INCH-POUNDS.** Install cotter pin, MS24665-155.
- Remove 0.125-inch-diameter drill rod from rigging holes in lever, plate, and rotary input.
- Connect power-available rotary input to engine HMU.
- Inspect work area to make certain it is clean and free of all tools and foreign matter.

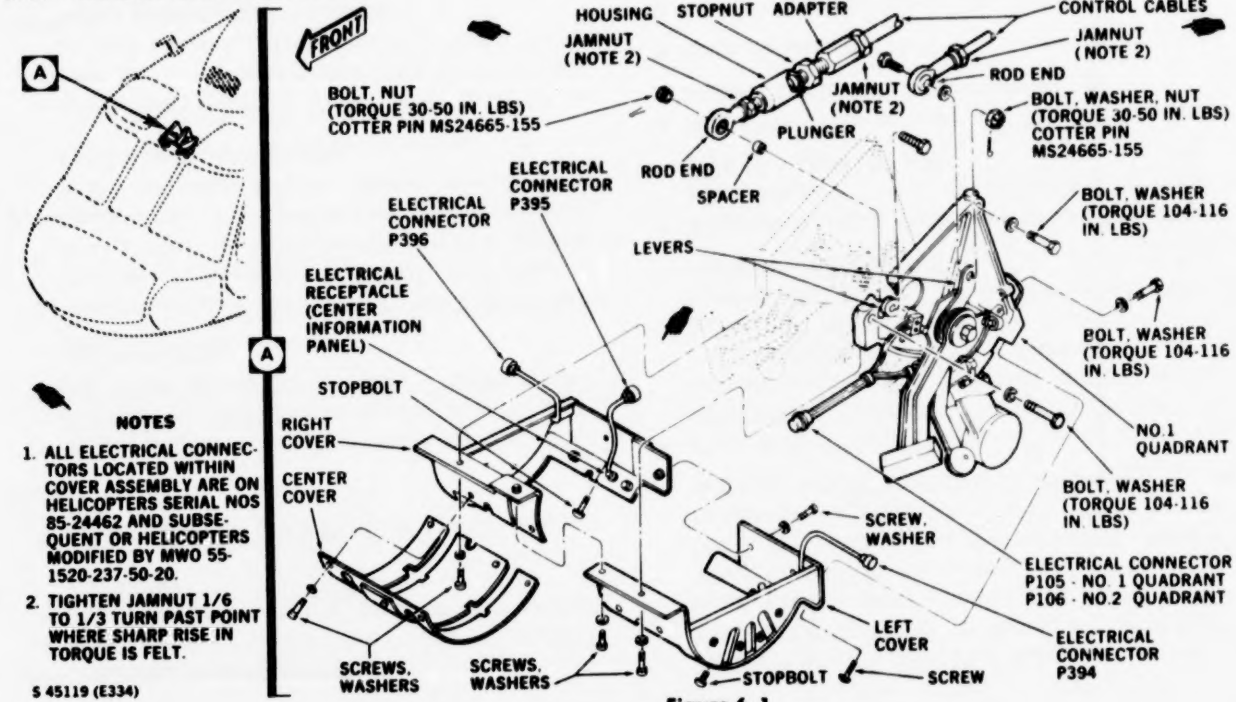
CAUTION

Be careful to avoid pinching wiring harness when installing covers.

STEP 1 REPLACE QUADRANT (CONT)

- On helicopters prior to serial No. 85-24462 not modified by MWO 55-1520-237-50-20: Install center and side covers on quadrant with washers and screws. Install stopbolt.
- On helicopters serial No. 85-24462 and subsequent, or helicopters modified by MWO 55-1520-237-50-20, do this:
  - Connect electrical connectors (P395 and P396) and install right side cover on quadrant with screws and washers. Install stopbolt.
  - Connect electrical connector (P394) and install left side cover on quadrant with screws and washers. Install stopbolt.
  - Insert electrical connector (MS90335-1) on center cover into receptacle on right side cover, and secure center cover with screws and washers.
- Seal edges of center cover with sealing compound, MIL-S-8802.
- Move fuel selector levers back to the off position.
- Lock fastener studs holding upper console to cockpit overhead, and hinge up upper console. Install screws and bracket at rear of quadrant.

STEP 1 REPLACE QUADRANT (CONT)


A
FRONT
HOUSING
STOPNUT
ADAPTER
CONTROL CABLES
JAMNUT (NOTE 2)
JAMNUT (NOTE 2)
ROD END
JAMNUT (NOTE 2)
BOLT, NUT (TORQUE 30-50 IN. LBS) COTTER PIN MS24665-155
PLUNGER
BOLT, WASHER, NUT (TORQUE 30-50 IN. LBS) COTTER PIN MS24665-155
ROD END
SPACER
ELECTRICAL CONNECTOR P395
ELECTRICAL CONNECTOR P396
BOLT, WASHER (TORQUE 104-116 IN. LBS)
LEVERS
ELECTRICAL RECEPTACLE (CENTER INFORMATION PANEL)
BOLT, WASHER (TORQUE 104-116 IN. LBS)
A
STOPBOLT
RIGHT COVER
NO.1 QUADRANT
CENTER COVER
BOLT, WASHER (TORQUE 104-116 IN. LBS)
SCREW, WASHER
ELECTRICAL CONNECTOR P105 - NO. 1 QUADRANT P106 - NO.2 QUADRANT
LEFT COVER
ELECTRICAL CONNECTOR P394
SCREWS, WASHERS
SCREWS, WASHERS
STOPBOLT
SCREW

NOTES

1. ALL ELECTRICAL CONNECTORS LOCATED WITHIN COVER ASSEMBLY ARE ON HELICOPTERS SERIAL NOS 85-24462 AND SUBSEQUENT OR HELICOPTERS MODIFIED BY MWO 55-1520-237-50-20.
2. TIGHTEN JAMNUT 1/6 TO 1/3 TURN PAST POINT WHERE SHARP RISE IN TORQUE IS FELT.

S 45119 (E334)

Figure 6-1

STEP 1 REPLACE QUADRANT (CONT)

- Install bracket on rear of quadrant with washers and screws.
- Move quadrant ENG POWER CONT lever in FLY detent.
- Adjust adapter on power-available push/pull control cable to contact face of plunger, plus one complete turn against plunger face. Tighten jamnut against adapter.
- Move quadrant ENG POWER CONT lever from FLY detent towards LOCKOUT, and listen at engine HMU for a click to indicate ECU lockout has occurred. Stop moving lever as soon as click is heard and adjust stopnut against housing. Turn stopnut back two full turns.
- Move ENG POWER CONT lever to IDLE to reset ECU, then back to LOCKOUT position and recheck for click. Also, make sure click is heard before stopnut touches housing.
- Adjust lever OFF stop. Turn bolt in so that when ENG POWER CONT is moved aft, push/pull cable internal stop or engine stop limits travel. When lever limits have been reached, turn bolt out until it contacts face of lever handle. Release handle and turn bolt out one full turn to be sure stop is hit before cable limit or engine stop.
- Place ENG FUEL SYS lever on quadrant in line with OFF on quadrant side cover. Adjust rod end on fuel selector valve push/pull control cable so rod end bearing and lever holes line up, and tighten jamnut. Bolt quadrant lever to control cable. **TORQUE NUT TO 30 - 50 INCH-POUNDS**. Install cotter pin, MS24665-155.
- Adjust start switch, starter override switch, starter abort switch, and fire extinguisher arming switch (TM 55-1520-237-23-9).
- Hinge up upper console and fasten to cockpit overhead by locking fastener studs.
- Connect battery.
- Do an operational check (TM 55-1520-237-23-3).

STEP 2 REPLACE FIRE EXTINGUISHER T-HANDLE LAMP

NOTE

The following procedures apply to both No. 1 and No. 2 quadrant T-handles.

REMOVE

- Turn off all electrical power.
- Pull #1 ENG EMER OFF or #2 ENG EMER OFF cover from T-handle.
- Pop out lamp with a screwdriver, and remove lamp from T-handle.

INSTALL

- Turn off all electrical power.
- Insert new lamp in T-handle.
- Install #1 ENG EMER OFF or #2 ENG EMER OFF cover on T-handle.
- Check to see that lamp lights (TM 55-1520-237-23-3).

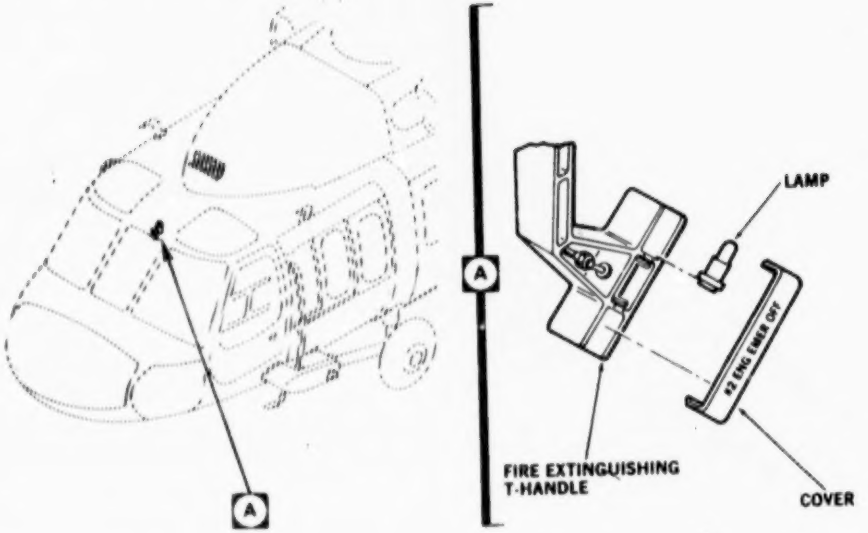

A
A
LAMP
#2 ENG EMER OFF
FIRE EXTINGUISHING T-HANDLE
COVER
S 45212 (B)

Figure 6-2

TASK 7

ENGINE CONTROL ROTARY INPUTS - REPLACE

- **REPLACE LOAD-DEMAND ROTARY INPUT - STEP 1**
- **REPLACE POWER-AVAILABLE ROTARY INPUT - STEP 2**

PERSONNEL REQUIRED

- Two People Required: MOS 68B - Aircraft Powerplant Repairer
  MOS 67T - Tactical Transport Helicopter Repairer

SUPPLIES

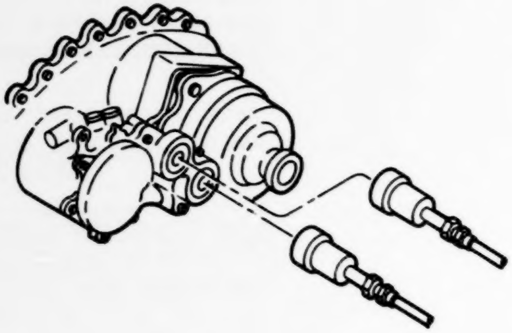
- Cotter Pin, MS24665-155 (1 Required, STEP 1)

TOOLS

- Drill Rod, 0.125-inch Diameter, 10-inches long (2 Required, STEP 1)
  (2 Required, STEP 2)
- Engine and Powertrain Repairer's Toolkit, NSN 5180-00-323-4944
- Torque Wrench, 30 - 150 inch-pounds, NSN 5120-00-542-4489 (STEP 1)

ALSO NEEDED

- TASK 23 (STEP 2)
- TM 55-1520-237-MTF (STEP 1)
- TM 55-1520-237-23-3 (STEP 2)
- TM 55-1520-237-23-4 (STEP 1)



S 44610 (B)

STEP 1 REPLACE LOAD-DEMAND ROTARY INPUT

NOTE

The following procedures apply to both No. 1 and No. 2 engine load-demand rotary inputs.

REMOVE

- Open engine cowling.
- Unlatch main rotor pylon sliding cover latches and slide cover open.
- Loosen coupling nut securing engine load-demand push/pull cable to adapter (Figure 7-1, Detail D).
- Disconnect load-demand rotary input from engine hydromechanical unit (Figure 7-1, Detail B).
- Compress spring on engine load demand rotary input by inserting 1/4 inch drive, 6 inch long extension through splines in front end of rotary barrel. Push against front of input drive until rear of input drive extends beyond adapter.

WARNING

To prevent injury to personnel, or damage to equipment, release spring tension slowly.

- Unhook rear of input drive from engine load-demand push/pull cable rod end. Slowly release pressure on extension until input drive is in full front position.
- Remove retaining nut from rotary input.

INSTALL

- Compress spring of load-demand rotary input by inserting 1/4 inch drive, 6 inch long extension through splines in front end of rotary barrel. Push against front of input drive until rear of input drive extends beyond adapter.

NOTE

When connecting push/pull cable to rotary input, make sure internal connection is made.

STEP 1 REPLACE LOAD-DEMAND ROTARY INPUT (CONT)

- Install retaining nut on rotary input.
- Hook engine load-demand push/pull cable rod end on exposed end of input drive. Slowly release pressure on extension, and remove extension from rotary input.
- Thread coupling nut on adapter. Do not torque nut connecting engine load-demand push/pull cable to rotary input now.

RIG ROTARY INPUT

- Connect external electrical or hydraulic power (TM 55-1520-237-23-4).

CAUTION

To prevent shearing rollpin in collective bias tube, do not move collective stick with push/pull cable attached to mixer lever and drill rod installed in rotary input.

- Turn on backup hydraulic pump and hold collective stick in low stick position.
- Make sure 0.125-inch-diameter drill rod in rotary input slides freely in and out of rigging hole. If required, readjust collective bias tube rod end by doing this:
  - Loosen jamnut on collective bias tube rod end.
  - Unbolt collective bias tube rod end from mixer.
  - Turn collective bias tube rod end a half-turn at a time.
  - Reinstall collective bias tube rod end on mixer with self-retaining bolt, washer(s), and nut (Figure 7-1, Details A and B).
  - Recheck that 0.125-inch diameter drill rod slides freely in and out of rigging hole when collective stick is in low position.

NOTE

Do the next step only if collective bias tube rod end has been unbolted from mixer lever.

- **TORQUE NUT THAT SECURES COLLECTIVE BIAS TUBE ROD END TO MIXER LEVER TO 30 - 50 INCH-POUNDS.** Install cotter pin, MS24665-155 (Figure 7-1, Detail A).

STEP 1 REPLACE LOAD-DEMAND ROTARY INPUT (CONT)

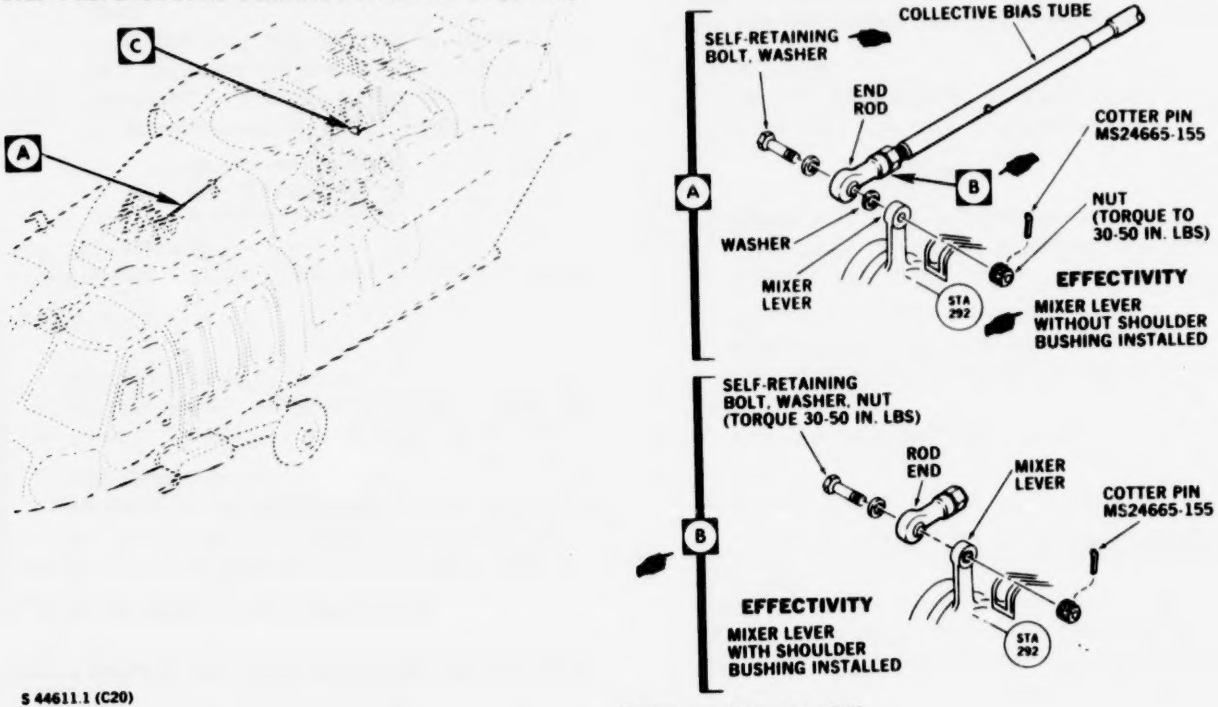
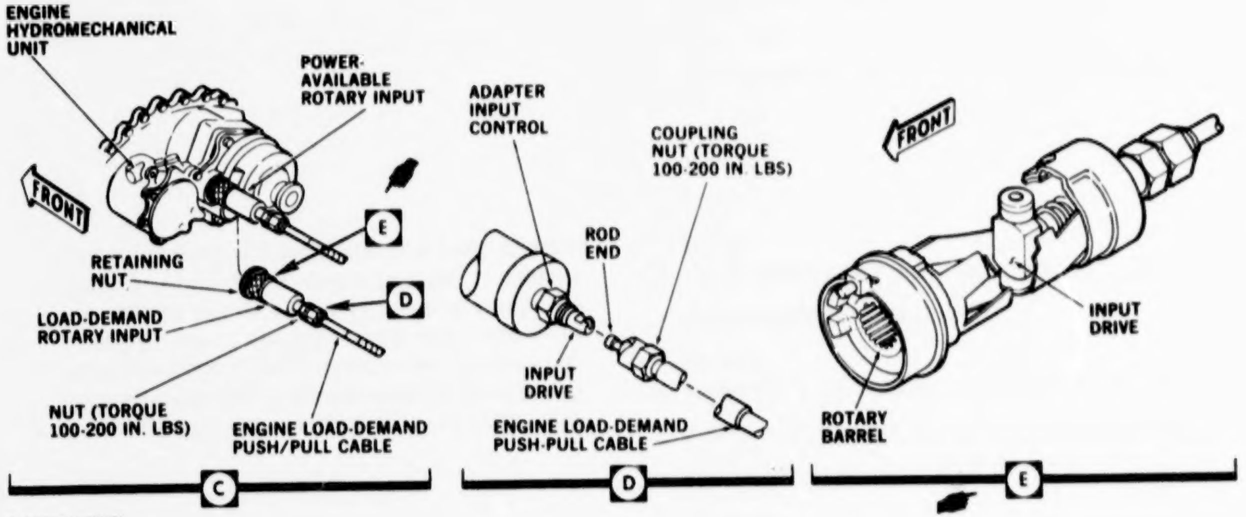

C
A
COLLECTIVE BIAS TUBE
SELF-RETAINING BOLT, WASHER
END ROD
COTTER PIN MS24665-155
A
B
NUT (TORQUE TO 30-50 IN. LBS)
WASHER
MIXER LEVER
STA 292
EFFECTIVITY
MIXER LEVER WITHOUT SHOULDER BUSHING INSTALLED
SELF-RETAINING BOLT, WASHER, NUT (TORQUE 30-50 IN. LBS)
ROD END
MIXER LEVER
COTTER PIN MS24665-155
B
EFFECTIVITY
MIXER LEVER WITH SHOULDER BUSHING INSTALLED
STA 292
S 44611.1 (C20)

Figure 7-1 (Sheet 1 of 2)

STEP 1 REPLACE LOAD-DEMAND ROTARY INPUT (CONT)


ENGINE HYDROMECHANICAL UNIT
POWER-AVAILABLE ROTARY INPUT
FRONT
E
RETAINING NUT
D
LOAD-DEMAND ROTARY INPUT
NUT (TORQUE 100-200 IN. LBS)
ENGINE LOAD-DEMAND PUSH/PULL CABLE
C
ADAPTER INPUT CONTROL
COUPLING NUT (TORQUE 100-200 IN. LBS)
ROD END
INPUT DRIVE
ENGINE LOAD-DEMAND PUSH-PULL CABLE
D
FRONT
INPUT DRIVE
ROTARY BARREL
E

S 44611.2 (BH1)

Figure 7-1 (Sheet 2 of 2)

STEP 1 REPLACE LOAD-DEMAND ROTARY INPUT (CONT)

NOTE

Deleted.

- Remove 0.125-inch-diameter drill rod from load-demand rotary input. Connect load-demand rotary input to engine hydromechanical unit (Figure 7-1, Detail B). Make sure that rotary input alignment pin engages slot on engine hydromechanical unit. Tighten retaining nut until it bottoms in support bracket. Slight axial/radial play is normal. **TORQUE NUT CONNECTING LOAD-DEMAND PUSH/PULL CABLE TO ROTARY INPUT TO 100 - 200 INCH-POUNDS.**
- Disconnect external power.
- Check area to be sure it is free of foreign objects.
- Close main rotor pylon sliding cover and fasten latches.
- Close engine cowling and latch.
- Do a maintenance test flight (TM 55-1520-237-MTF).

STEP 2 REPLACE POWER-AVAILABLE ROTARY INPUT

NOTE

The following procedures apply to both No. 1 and No. 2 engine power-available rotary inputs.

REMOVE

- Open engine cowling.
- Place quadrant ENG POWER CONT lever OFF.

STEP 2 REPLACE POWER-AVAILABLE ROTARY INPUT (CONT)

- Disconnect power-available rotary input from engine hydromechanical unit.
- Disconnect power-available rotary input from engine power-available push/pull cable. Remove retaining nut from rotary input.

INSPECT

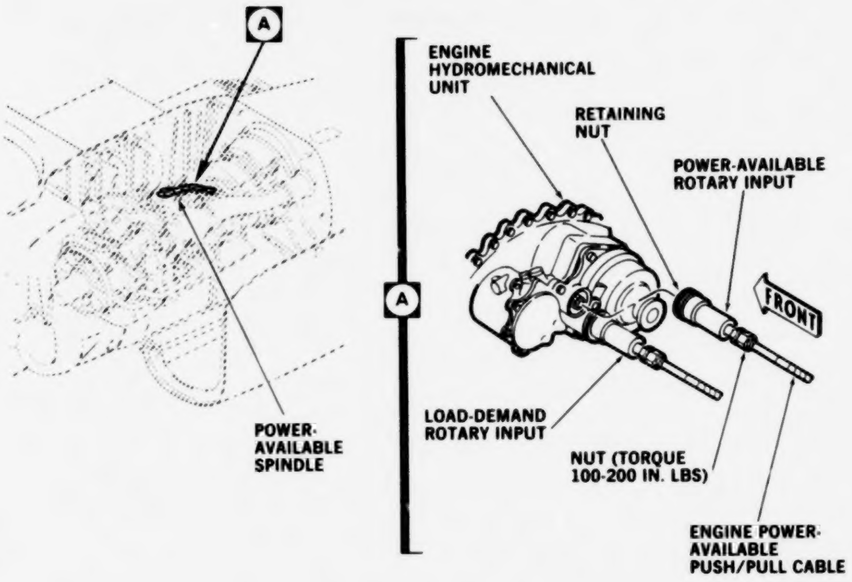
- Inspect power-available rotary input (TASK 23).

INSTALL

NOTE

When connecting push/pull cable to rotary input, make sure internal connection is made.

- Install retaining nut on rotary input and connect rotary input to engine power-available push/pull cable. Do not torque nut connecting power available push/pull cable to rotary input now.
- Place lever on quadrant in IDLE detent.


A
POWER-AVAILABLE SPINDLE
A
ENGINE HYDROMECHANICAL UNIT
RETAINING NUT
POWER-AVAILABLE ROTARY INPUT
FRONT
LOAD-DEMAND ROTARY INPUT
NUT (TORQUE 100-200 IN. LBS)
ENGINE POWER-AVAILABLE PUSH/PULL CABLE

S 44612 (C11)

Figure 7-2

STEP 2 REPLACE POWER-AVAILABLE ROTARY INPUT (CONT)

- Insert 0.125-inch-diameter drill rod in rotary input. If rod can be inserted, remove rod and attach rotary input to engine.
- If rod cannot be inserted, rig quadrant (TASK 6).

Page 7-6.1/7-6.2 Deleted

STEP 2 REPLACE POWER-AVAILABLE ROTARY INPUT (CONT)

NOTE

To repeat ECU lockout click, ENG POWER CONT lever must be returned to IDLE, to reset ECU.

- Adjust lever OFF stop. Turn bolt in so that when ENG POWER CONT lever is moved aft, push/pull cable internal stop or engine stop limits

STEP 2 REPLACE POWER-AVAILABLE ROTARY INPUT (CONT)

- Deleted.
- When all rigging has been completed, place quadrant ENG POWER CONT lever OFF.
- Hinge up upper console and fasten to cockpit overhead by locking fastener studs.
- Check area to be sure it is free of foreign objects.
- Close engine cowling and latch.
- Do an operational check (TM 55-1520-237-23-3).

SUPPLIES (CONT)

- Grommet, MS35489-12 (1 Required) (STEPS 3, 4)
- Lockwire, MS20995NC20 (STEP 1)
- Rollpin, 094-0562LDP (CEM Co., Danielson, Ct.) (STEP 1)
- Sealing Compound, MIL-S-8802 (STEPS 3, 4)
- Sleeve, Anti-Chafe, NSN 9330-00-688-7856 (As Required) (STEPS 1, 2, 3)
- Tiedown straps, MS3367-1-9 (As Required) (STEPS 1, 2, 3)

TOOLS

- Drill Rods, 0.125-inch diameter, 10 inches long (STEPS 1, 2, 3)
- Powerplant Tool Kit, NSN 5180-00-323-4944
- Torque Wrench, 30 - 150 inch-pounds, NSN 1520-00-542-4489 (STEPS 2, 3, 4)

ALSO NEEDED

- TASK 1 (STEPS 1, 2, 3, 4)
- TM 43-0103 (MIL-I-6868)
- TM 55-1520-237-MTF (STEP 1)
- TM 55-1520-237-23-3 (STEPS 2, 3, 4, 5)
- TM 55-1520-237-23-4 (STEP 1)

STEP 1 REPLACE ENGINE LOAD-DEMAND PUSH/PULL CABLE

NOTE

The following procedures apply to both left and right side load-demand push/pull cables.

REMOVE

- Open engine cowling.
- Remove engine air inlet (TASK 1).
- Unlatch main rotor pylon sliding cover latches and slide cover forward.
- Connect external electrical power (TM 55-1520-237-23-4).
- Turn on backup hydraulic power.
- Move collective stick in cockpit in low stick position.
- Disconnect load-demand rotary input from engine hydromechanical unit (HMU) (DETAIL A). Insert 0125-inch-diameter drill rod through rigging hole in outer housing and inner rotary driver of rotary input to hold spring compressed.

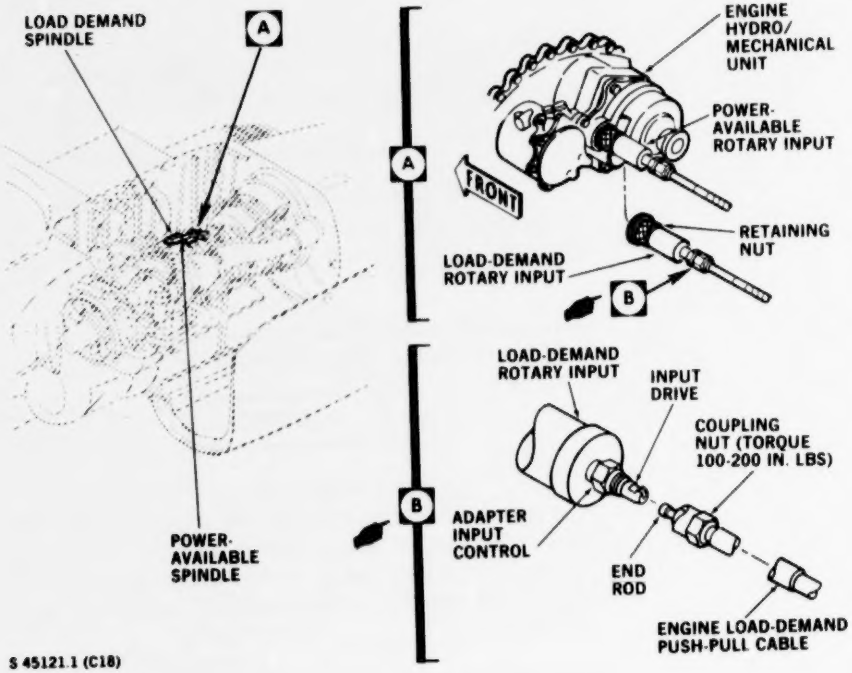
CAUTION

To prevent shearing rollpin in collective bias tube, do not move flight controls while drill rod is installed.

- Disconnect engine load-demand push/pull cable from load-demand rotary input. Make sure retaining nut stays on load-demand rotary input.
- Turn off backup hydraulic power.
- Unclamp engine load-demand push/pull cable from firewall.

STEP 1 REPLACE ENGINE LOAD-DEMAND PUSH/PULL CABLE (CONT)

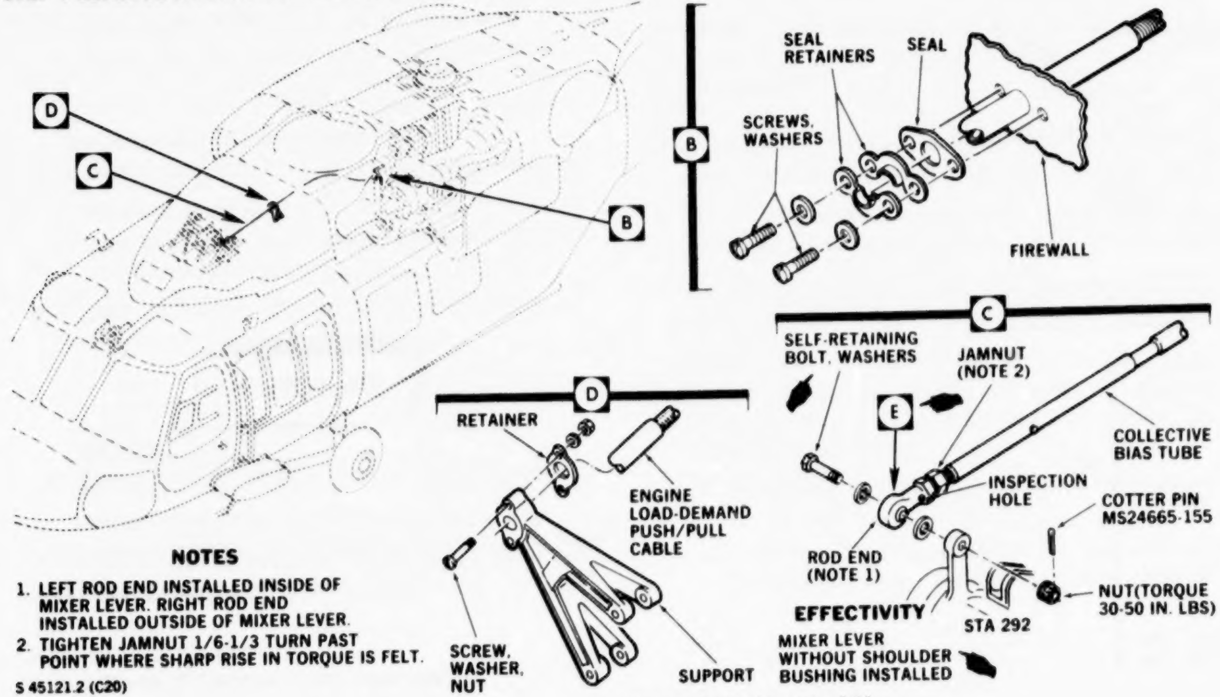
- Remove screws, seal retainers, and seal from firewall and cable (Detail B).
- Unbolt collective bias tube rod end from mixer lever at station 292 on main rotor pylon deck (Detail C). Remove rod end and nut from collective bias tube. Inspect rod end for radial and axial play. No play is acceptable.
- Remove screws and retainer away from support.
- Remove load-demand push/pull cable from support and helicopter (Detail D). Remove retainer from cable.


LOAD DEMAND SPINDLE
A
POWER-AVAILABLE SPINDLE
A
ENGINE HYDRO/MECHANICAL UNIT
POWER-AVAILABLE ROTARY INPUT
FRONT
RETAINING NUT
LOAD-DEMAND ROTARY INPUT
B
LOAD-DEMAND ROTARY INPUT
INPUT DRIVE
COUPLING NUT (TORQUE 100-200 IN. LBS)
B
ADAPTER INPUT CONTROL
END ROD
ENGINE LOAD-DEMAND PUSH-PULL CABLE

S 45121.1 (C18)

Figure 8-1 (Sheet 1 of 3)

STEP 1 REPLACE ENGINE LOAD-DEMAND PUSH/PULL CABLE (CONT)


D
C
B
B
SEAL RETAINERS
SEAL
SCREWS, WASHERS
FIREWALL
C
SELF-RETAINING BOLT, WASHERS
JAMNUT (NOTE 2)
E
COLLECTIVE BIAS TUBE
INSPECTION HOLE
COTTER PIN MS24665-155
ROD END (NOTE 1)
NUT(TORQUE 30-50 IN. LBS)
STA 292
D
RETAINER
ENGINE LOAD-DEMAND PUSH/PULL CABLE
SCREW, WASHER, NUT
SUPPORT

EFFECTIVITY

MIXER LEVER WITHOUT SHOULDER BUSHING INSTALLED

NOTES

1. LEFT ROD END INSTALLED INSIDE OF MIXER LEVER. RIGHT ROD END INSTALLED OUTSIDE OF MIXER LEVER.
2. TIGHTEN JAMNUT 1/6-1/3 TURN PAST POINT WHERE SHARP RISE IN TORQUE IS FELT.

S 45121.2 (C20)

Figure 8-1 (Sheet 2 of 3)

STEP 1 REPLACE ENGINE LOAD-DEMAND PUSH/PULL CABLE (CONT)

PARTS REPLACEMENT

- Remove rollpin from collective bias tube and load-demand push/pull cable (Detail F).
- Slide load-demand push/pull cable from collective bias tube.

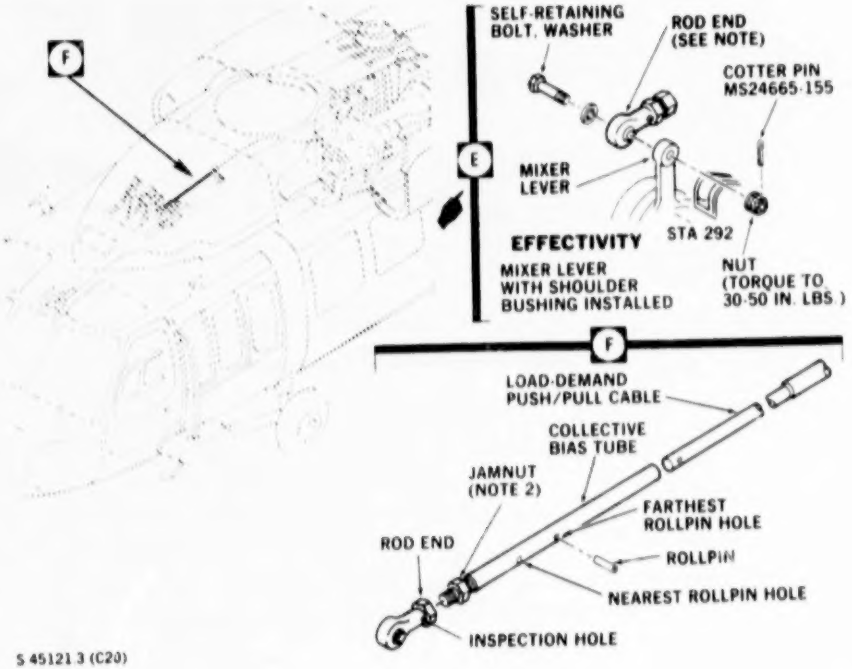
WARNING

This is a shear section. Do not use any rollpin other than 094-0562LDP to attach load demand push/pull cable to collective bias tube.

- Connect new load-demand push/pull cable to collective bias tube with rollpin.

NOTE

There are two rollpin holes in collective bias tube. Either hole can be used now until final adjustment at installation.


F
E
SELF-RETAINING BOLT, WASHER
ROD END (SEE NOTE)
COTTER PIN MS24665-155
MIXER LEVER
STA 292
EFFECTIVITY
MIXER LEVER WITH SHOULDER BUSHING INSTALLED
NUT (TORQUE TO 30-50 IN. LBS.)
F
LOAD-DEMAND PUSH/PULL CABLE
COLLECTIVE BIAS TUBE
JAMNUT (NOTE 2)
FARTHEST ROLLPIN HOLE
ROD END
ROLLPIN
NEAREST ROLLPIN HOLE
INSPECTION HOLE

S 45121.3 (C20)

Figure 8-1 (Sheet 3 of 3)

STEP 1 REPLACE ENGINE LOAD-DEMAND PUSH/PULL CABLE (CONT)

- Route load-demand push/pull cable from mixer lever at station 292 on upper forward deck through engine compartment firewall.
- Add anti-chafe sleeve, NSN 9330-00-688-7856, to cable from station 325.00 to 330.00, and from 353.00 to 368.00. Hold sleeve in place with tie-down straps, MS3367-1-9.
- Install retainer on support with screws, washers, and nuts.

NOTE

Make sure retaining nut is installed on load-demand rotary input before connecting to engine load-demand push/pull cable.

- Compress spring of load-demand rotary input and insert a 0.125-inch-diameter drill rod.

NOTE

When connecting push/pull cable to rotary input, make sure internal connection is made.

- Connect engine load demand push/pull cable to load-demand rotary input. Do not torque nut now.
- Install seal and seal retainers around push/pull cable and fasten to firewall with screws (Detail B).
- Clamp load-demand push/pull cable to every rib along firewall.
- Turn on backup hydraulic power. Hold collective stick down against stop and adjust rod end bearing to line up with hole in mixer lever at station 292 on upper forward deck as follows (Detail E):
  - Thread rod end on or off collective bias tube to line up holes.
  - If rod end bottoms on collective bias tube before boltholes line up, remove rollpin, line up

STEP 1 REPLACE ENGINE LOAD-DEMAND PUSH/PULL CABLE (CONT)

hole in load-demand push/pull cable with hole in collective bias tube nearest to rod end, and install rollpin. Lockwire, MS20995NC20, rollpin to tube. Adjust rod end again.

- If boltholes line up, check that lockwire, MS20995NC20, cannot pass through inspection hole in rod end. If it does, remove rollpin, line up hole in load-demand push/pull cable with hole in collective bias tube farthest from rod end, and install rollpin. Lockwire, MS20995NC20, rollpin to tube. Adjust rod end again.
- **TIGHTEN JAMNUT 1/6 TO 1/3 TURN PAST POINT WHERE SHARP RISE IN TORQUE IS FELT.**

CAUTION

To prevent shearing rollpin in collective bias tube, do not move collective stick with push/pull cable attached to mixer lever and drill rod installed in rotary input.

NOTE

Right side load-demand push/pull cable rod end is connected to the outside of mixer lever. Left side load-demand push/pull cable rod end is connected to the inside of mixer lever.

- Install washer between collective bias tube rod end and mixer lever, and connect rod end to mixer lever with bolt, washer, and nut. **TORQUE NUT TO 30 - 50 INCH-POUNDS.** Install cotter pin, MS24665-155 (Figure 8-1, Detail C).

NOTE

Make sure that a washer is installed next to bolt head, and between collective bias tube rod end and mixer lever (Figure 8-1, Detail C).

- Be sure 0.125-inch-diameter drill rod in rotary input slides freely in and out of rigging hole after installing bolt in rod end and mixer lever.

STEP 1 REPLACE ENGINE LOAD-DEMAND PUSH/PULL CABLE (CONT)

- Remove 0.125-inch-diameter drill rod from load-demand rotary input. Connect load-demand rotary input to engine hydromechanical unit (Figure 8-1, Details A and B). Make sure that rotary input alignment pin engages in slot on engine hydromechanical unit. Tighten retaining nut until it bottoms in support bracket. Slight axial/radial play is normal. **TORQUE NUT CONNECTING LOAD-DEMAND PUSH/PULL CABLE TO ROTARY INPUT TO 100 - 200 INCH-POUNDS.**

- Close main rotor pylon sliding cover and fasten latches.

- Install engine air inlet (TASK 1).

- Close engine cowling and latch.

- Disconnect external power.

- Do a maintenance test flight (TM 55-1520-237-MTF).

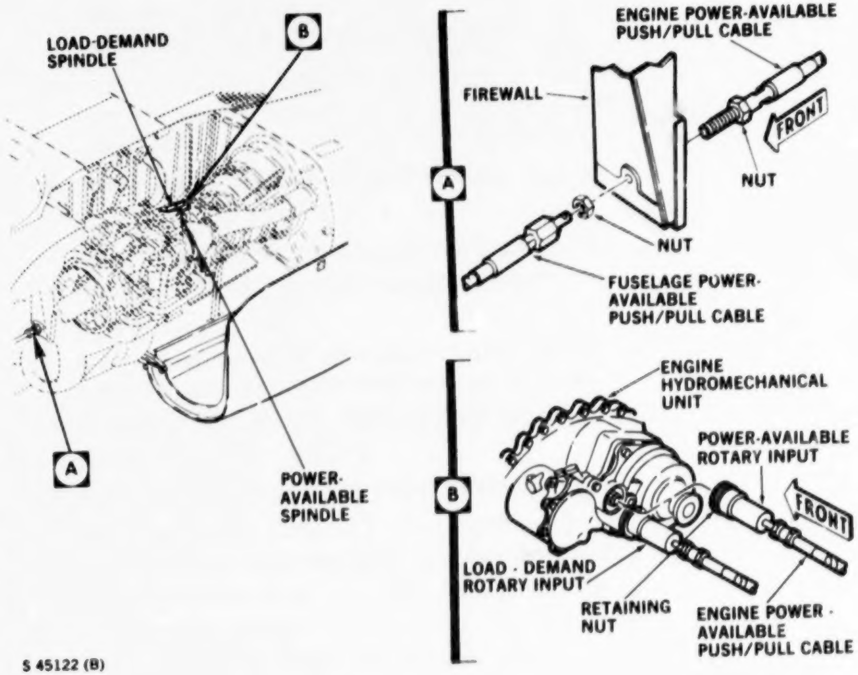
STEP 2 REPLACE ENGINE POWER-AVAILABLE PUSH/PULL CABLE

NOTE

> The following procedures apply to both No. 1 and No. 2 engine power-available push/pull cables.

REMOVE

- Open engine cowling.
- Remove engine air inlet (TASK 1, STEP 1).
- Place quadrant ENG POWER CONT lever OFF.
- Disconnect power-available rotary input from engine hydromechanical unit (Detail B).
- Disconnect fuselage power-available push/pull cable from engine power-available push/pull cable at firewall (Detail A). Disconnect engine power-available push/pull cable from firewall. Keep nut for installing new cable.
- Unclamp engine power-available push/pull cable from firewall. Remove nut from cable. Keep nut for installing new cable.


LOAD-DEMAND SPINDLE
B
A
POWER-AVAILABLE SPINDLE
ENGINE POWER-AVAILABLE PUSH/PULL CABLE
FIREWALL
A
FRONT
NUT
NUT
FUSELAGE POWER-AVAILABLE PUSH/PULL CABLE
ENGINE HYDROMECHANICAL UNIT
POWER-AVAILABLE ROTARY INPUT
B
FRONT
LOAD - DEMAND ROTARY INPUT
RETAINING NUT
ENGINE POWER - AVAILABLE PUSH/PULL CABLE

S 45122 (B)

Figure 8-2

STEP 2 REPLACE ENGINE POWER-AVAILABLE PUSH/PULL CABLE (CONT)

- Disconnect engine power-available push/pull cable from power-available rotary input. Make sure retaining nut stays on power-available rotary input.

INSPECT

- Visually inspect engine power-available push/pull cable for separation of spiral casing from end fitting. Separation up to 0.50 inch is allowable, but cable must be changed as soon as practicable, and not later than the next 10 HOUR/14 DAY inspection. **SEPARATION GREATER THAN 0.50 INCH IS NOT ACCEPTABLE.**

INSTALL

NOTE

- Make sure retaining nut is installed on power-available rotary input before connecting to engine power-available push/pull cable.
- When connecting push/pull cable to rotary input, make sure internal connection is made.

- Connect engine power-available push/pull cable to power-available rotary input. Do not torque nut now.
- Install nut on end of engine power-available push/pull cable.
- Add anti-chafe sleeve, NSN 9330-00-688-7856, from station 346.00 to power-available rotary input. Hold sleeve in place with tiedown straps, MS3367-1-9.
- Place end of engine power-available push/pull cable through firewall. Install nut holding cable to firewall (Detail A).
- Clamp engine power-available push/pull cable to firewall.

NOTE

When connecting push/pull cables, make sure internal connection is made.

STEP 2 REPLACE ENGINE POWER-AVAILABLE PUSH/PULL CABLE (CONT)

- Connect fuselage power-available push/pull cable to engine power-available push/pull cable and clamp to every rib along firewall. **TORQUE NUT CONNECTING PUSH/PULL CABLES TO 100 - 200 INCH-POUNDS.**
- Remove center and side covers from quadrant.
- Move quadrant ENG POWER CONT lever in IDLE detent and insert 0.125-inch-diameter drill rod through rigging holes in lever and plate. Insert 0.125-inch-diameter drill rod through rigging hole in outer housing and inner rotary driver of rotary input. If drill rod cannot be inserted in rotary input, do this:
  - Unlock fastener studs holding upper console to cockpit overhead, and hinge down upper console. Unbolt and readjust rod end on fuselage power-available push/pull cable until rod end bearing and quadrant POWER CONT lever holes line up, and tighten nut.

  NOTE

  Before installing bolt in lever holes, pull rod end bearing forward to remove slack in cable.

  - Bolt fuselage power-available push/pull cable rod to quadrant ENG POWER CONT lever.
  - **TORQUE NUT TO 30 - 50 INCH-POUNDS** and install cotter pin, MS24665-155.
- Remove 0.125-inch-diameter drill rod from rigging holes in plate, lever, and rotary input.

STEP 2 REPLACE ENGINE POWER-AVAILABLE PUSH/PULL CABLE (CONT)

- Install quadrant covers.
- Connect power-available rotary input to engine hydromechanical unit (Detail B). Make sure that rotary input alignment pin engages slot on engine HMU. Tighten retaining nut until it bottoms in support bracket. Slight axial/radial play is normal.
- Move quadrant ENG POWER CONT lever in FLY detent.
- Adjust adapter on fuselage power available push/pull cable to contact face of plunger plus one complete turn against plunger face.
- Move quadrant ENG POWER CONT lever from FLY detent towards LOCKOUT and listen at engine HMU for a click to indicate ECU lockout has occurred.
- Stop moving lever as soon as click is heard, and adjust stop nut against housing. Turn stop nut back two full turns.
- Move ENG POWER CONT lever to IDLE to reset ECU, then back to LOCKOUT, and recheck for audible click. Make sure click is heard before housing touches stop nut.

NOTE

If click is not heard before housing touches stopnut, do this:

- Remove input assembly from PAS shaft.
- Install rigging pins in quadrant and input assembly.
- **In cockpit, remove bolt from PAS lever rod end and shorten rod end bearing by one turn. Replace rod end and bolt.**
- At engine, remove rigging pin, install input assembly on engine shaft with retaining nut, and check again for click.
- It is permissible to shorten rod end bearing until rigging pin is hard to remove.

- Hinge up upper console and fasten to cockpit overhead by locking fastener studs.
- Install engine air inlet (TASK 1).
- Close engine cowling and latch.
- Do an operational check (TM 55-1520-237-23-3).

STEP 3 REPLACE FUSELAGE POWER-AVAILABLE PUSH/PULL CABLE

REMOVE

- Turn off all electrical power.
- Unlock fastener studs holding upper console to cockpit overhead, and hinge down upper console.
- Remove center and side covers from quadrant.
- Move quadrant ENG POWER CONT lever in IDLE detent.
- Open engine cowling.
- Disconnect power-available rotary input from engine hydromechanical unit.

NOTE

The following procedures apply to both left and right side fuselage power-available push/pull cables.

- Unbolt fuselage power available push/pull cable rod end from quadrant ENG POWER CONT lever (Detail A).
- Unbolt bracket halves holding fuselage power-available push/pull cable and fuel selector valve push/pull cable to cockpit ceiling (Detail A).
- Remove engine air inlet (TASK 1).
- Remove soundproofing from cabin ceiling.
- Disconnect fuselage power-available push/pull cable from engine power-available push/pull cable at firewall (Detail B).

STEP 3 REPLACE FUSELAGE POWER-AVAILABLE PUSH/PULL CABLE (CONT)

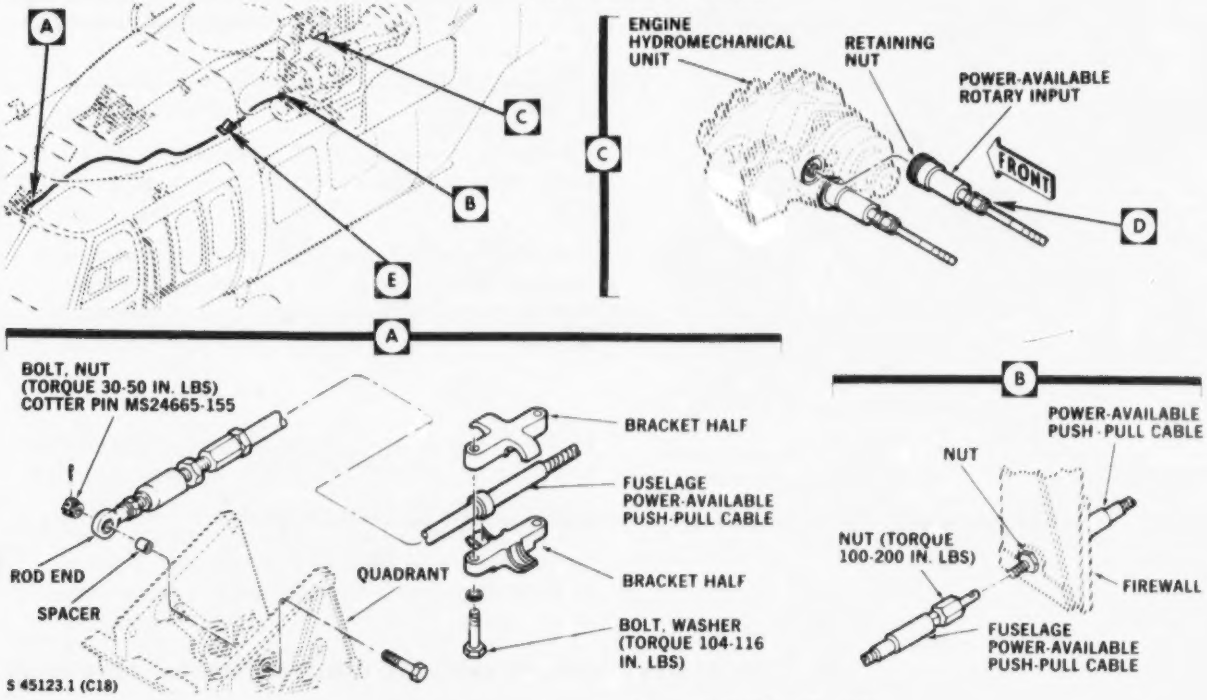
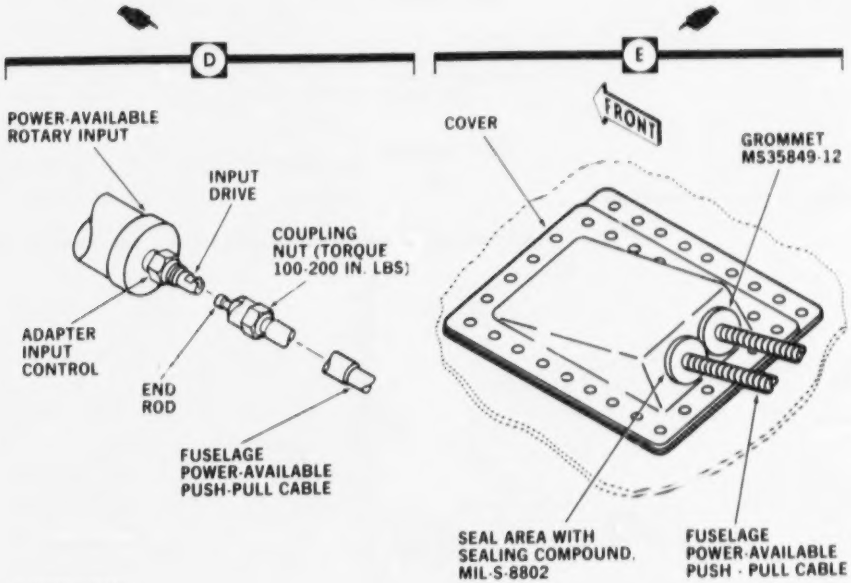

A
C
B
E
C
ENGINE HYDROMECHANICAL UNIT
RETAINING NUT
POWER-AVAILABLE ROTARY INPUT
FRONT
D
A
BOLT, NUT (TORQUE 30-50 IN. LBS) COTTER PIN MS24665-155
BRACKET HALF
FUSELAGE POWER-AVAILABLE PUSH-PULL CABLE
ROD END
QUADRANT
BRACKET HALF
SPACER
BOLT, WASHER (TORQUE 104-116 IN. LBS)
S 45123.1 (C18)
B
POWER-AVAILABLE PUSH - PULL CABLE
NUT
NUT (TORQUE 100-200 IN. LBS)
FIREWALL
FUSELAGE POWER-AVAILABLE PUSH-PULL CABLE

Figure 8-3 (Sheet 1 of 2)

STEP 3 REPLACE FUSELAGE POWER-AVAILABLE PUSH/PULL CABLE (CONT)


D
E
POWER-AVAILABLE ROTARY INPUT
INPUT DRIVE
COUPLING NUT (TORQUE 100-200 IN. LBS)
ADAPTER INPUT CONTROL
END ROD
FUSELAGE POWER-AVAILABLE PUSH-PULL CABLE
COVER
FRONT
GROMMET MS35849-12
SEAL AREA WITH SEALING COMPOUND, MIL-S-8802
FUSELAGE POWER-AVAILABLE PUSH - PULL CABLE

S 45123.2 (C18)

Figure 8-3 (Sheet 2 of 2)

STEP 3 REPLACE FUSELAGE POWER-AVAILABLE PUSH/PULL CABLE (CONT)

- Unclamp fuselage power-available push/pull cable from helicopter.
- Carefully pull cable from grommet and remove fuselage power-available push/pull cable from helicopter.
- Remove rod end, stop nut, housing, retainers, spring, plunger, retainer, nut, adapter, jamnut, and cable. Inspect rod end for radial and axial play. **NO PLAY ALLOWED.**

INSPECT

- Visually inspect fuselage power-available push/pull cable for separation of spiral casing from end fitting. Separation up to 0.50 inch is allowable, but cable must be changed as soon as practicable, and not later than the next 10 HOUR/14 DAY inspection. **SEPARATION GREATER THAN 0.50 INCH IS NOT ACCEPTABLE.**

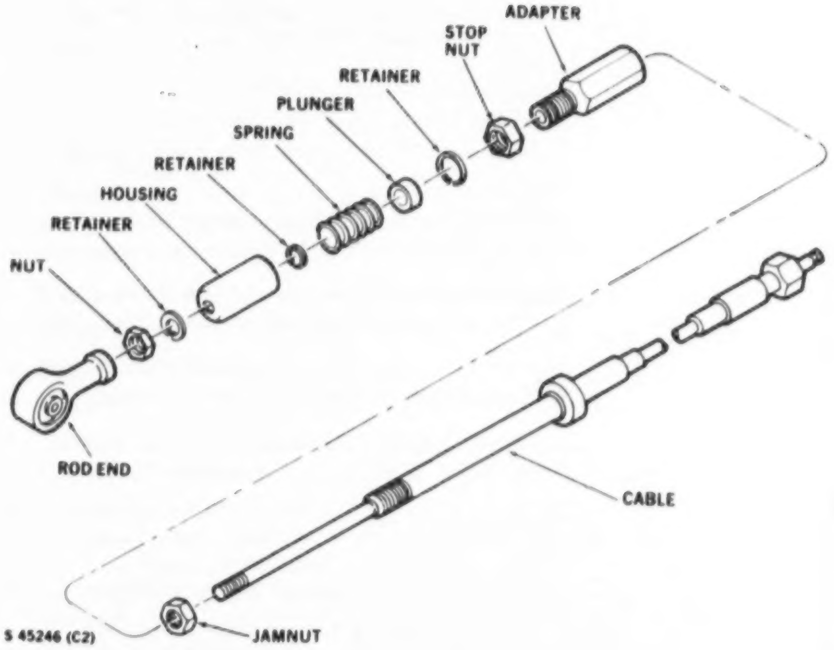

ADAPTER
STOP NUT
RETAINER
PLUNGER
SPRING
RETAINER
HOUSING
RETAINER
NUT
ROD END
CABLE
JAMNUT
S 45246 (C2)

Figure 8-3.1

STEP 3 REPLACE FUSELAGE POWER-AVAILABLE PUSH/PULL CABLE (CONT)

INSTALL

- Install jamnut, adapter, stop nut, retainer, plunger, spring, retainer, housing, retainer, nut, and rod end on replacement cable.
- If grommet in cover at station 338 is loose or worn through, replace it.
- Route fuselage power-available push/pull cable from quadrant ENG POWER CONT lever in cockpit ceiling to engine compartment firewall.
- If grommet, MS35489-12, is loose or worn through, do this:
  - Make a 45° cut through edge of replacement grommet.
  - Remove old grommet and clean adhesive from cover using a wooden or plastic scraper and a clean cloth dampened with degreasing solvent, O-T-620. Do not allow solvent to dry on cover. Keep turning cloth after each wipe.
  - Lightly scuff inside of outer groove of grommet with abrasive cloth, P-C-451.
  - Apply a light coat of adhesive, Pliobond No. 20, to groove of grommet and edge of hole in cover. Allow adhesive to air-dry for 10 minutes or until tacky.
  - Install grommet in hole in cover. For best results, allow adhesive to cure for 24 hours.
- Carefully slide fuselage power-available push/pull cable through grommet.
- Apply sealing compound, MIL-S-8802, to edge of grommet and cover, at 45° slice and around cable.
- Add anti-chafe sleeve, NSN 9330-00-688-7856, 5 inches long, where cable passes through each fuselage frame. Hold sleeve in place with tiedown straps, MS3367-1.

NOTE

When connecting push/pull cable, make sure internal connection is made.

STEP 3 REPLACE FUSELAGE POWER-AVAILABLE PUSH/PULL CABLE (CONT)

- Connect fuselage power-available push/pull cable to engine power-available push/pull cable at firewall (Detail B). **TORQUE NUT TO 100 - 200 INCH-POUNDS.**

- Clamp fuselage power-available push/pull cable to fuel selector valve push/pull cable every 6 inches from ENG POWER CONT lever to station 340.00.

- Bolt fuselage power-available push/pull cable and fuel selector valve push/pull cable to cockpit overhead with bolts, washers, and bracket halves (Detail A). **TORQUE BOLTS TO 104 - 116 INCH-POUNDS.**

- Clamp fuselage power-available push/pull cable to structure.

- Move quadrant power control lever in IDLE detent and insert 0.125-inch-diameter drill rod through rigging holes in lever and plate. Insert 0.125-inch-diameter drill rod through rigging hole in outer housing and inner rotary driver of rotary input.

- Adjust rod end on fuselage power-available push/pull cable until rod end bearing and quadrant POWER CONT lever holes line up, and tighten nut.

- Bolt fuselage power-available push/pull cable rod end to quadrant END POWER CONT lever.

- **TORQUE NUT TO 30 - 50 INCH-POUNDS.** Install cotter pin, MS24665-155 (Detail A).

- Remove 0.125-inch-diameter drill rod from rigging holes in lever, plate, and rotary input.

- Connect power-available rotary input to engine hydromechanical unit.

- Move quadrant ENG POWER CONT lever in FLY detent.

- Adjust adapter on fuselage power available push/pull cable to contact face of plunger plus one complete turn against plunger face. Tighten jamnut against adapter.

STEP 3 REPLACE FUSELAGE POWER-AVAILABLE PUSH/PULL CABLE (CONT)

- Move quadrant ENG POWER CONT lever from FLY detent towards LOCKOUT, and listen at engine HMU for a click to indicate ECU lockout has occurred. Stop moving lever as soon as click is heard and adjust stop nut against housing. Turn stopnut back two full turns.

NOTE

If click is not heard before housing touches stopnut, do this:

— Remove input assembly from PAS shaft.

— Install rigging pins in quadrant and input assembly.

— In cockpit remove bolt from PAS lever rod end and shorten the rod end bearing by one turn. Replace rod end and bolt.

— At engine, remove rigging pin, install input assembly on engine shaft with retaining nut and check for click again.

— It is permissible to shorten rod end bearing until rigging pin is hard to remove.

STEP 3 REPLACE FUSELAGE POWER-AVAILABLE PUSH/PULL CABLE (CONT)

- Move ENG POWER CONT lever to IDLE to reset ECU, then back to LOCKOUT position and recheck for audible click. Also make sure click is heard before housing touches stop nut.

- Adjust lever OFF stop. Turn bolt in so that when ENG POWER CONT is moved aft, push/pull cable internal stop or engine stop limits travel. When lever limits have been reached, turn bolt out until it contacts face of lever handle. Release handle and turn bolt out one full turn, to insure stop is hit before cable limit or engine stop.
- Hinge up upper console and fasten to cockpit overhead by locking fastener studs.
- Install covers on quadrant with washers and screws.
- Install engine air inlet (TASK 1).
- Install soundproofing in cabin ceiling.
- Close engine cowling and latch.
- Do an operational check (TM 55-1520-237-23-3).

STEP 4 REPLACE FUEL SELECTOR VALVE PUSH/PULL CABLE

REMOVE

- Turn off all electrical power.
- Unlock fastener studs holding upper console to cockpit overhead, and hinge down upper console.
- Move ENG FUEL SYS lever OFF.
- Remove cover from quadrant.

NOTE

The following procedures apply to both left and right side fuel selector valve push/pull cables.

- Unbolt fuel selector valve push/pull cable rod end from quadrant fuel selector lever (Detail A). Remove rod end and nut from cable. Inspect rod end for axial and radial play. No play is acceptable.
- Unbolt bracket halves holding fuel selector valve push/pull cable and fuselage power available push/pull cable to cockpit overhead (Detail A).
- Open engine cowling.
- Open oil cooler compartment access doors.
- Remove engine air inlet (TASK 1).
- Remove soundproofing from cabin ceiling.
- Disconnect fuel selector valve push/pull cable from fuel selector valve control box (Detail B).
- Unclamp fuel selector valve push/pull cable from firewall and structure. Carefully pull cable from grommet and remove cable from helicopter.

INSPECT

- Visually inspect fuel selector valve push/pull cable for separation of spiral casing from end fitting. Separation up to 0.50 inch is allowable, but cable must be changed as soon as practicable but not later than the next 10 HOUR/14 DAY inspection. **SEPARATION GREATER THAN 0.50 INCH IS NOT ACCEPTABLE.**
- If grommet in cover at station 338 is loose or worn through, replace it.

STEP 4 REPLACE FUEL SELECTOR VALVE PUSH/PULL CABLE (CONT)

INSTALL

- Route fuel selector valve push/pull cable from quadrant fuel selector lever to oil cooler compartment firewall.
- Connect fuel selector valve push/pull cable to fuel selector valve control box. **TORQUE NUT TO 100 - 200 INCH-POUNDS** (Detail B).
- If grommet, MS35489-12, is loose or worn through, do this:
  - Make a 45° cut through edge of replacement grommet.
  - Remove old grommet and clean adhesive from cover. Using a wooden or plastic scraper and a clean cloth dampened with degreasing solvent, O-T-620. Do not allow solvent to dry on airframe. Keep turning cloth after each wipe.
  - Lightly scuff insides of outer groove of grommet with abrasive cloth, P-C-451.
  - Apply a light coat of adhesive, Pliobond No. 20, to groove of grommet and edge of hole in cover. Allow adhesive to air-dry for 10 minutes or until tacky.
  - Install grommet in hole in cover. For best results, allow adhesive to cure for 24 hours.
- Carefully slide fuel selector valve push/pull cable through grommet.
- Apply sealing compound, MIL-S-8802 to edge of grommet and cover at 45° slice and around cable.
- Add anti-chafe sleeve, NSN 9330-00-688-7856, to fuel selector valve push/pull cable at these locations:
  - From station 245.00 to station 253.00.
  - From station 257.00 to station 263.00.
  - From station 270.00 to station 275.00.
  - From station 278.00 to station 283.00 at buttline 5.0.

STEP 4 REPLACE FUEL SELECTOR VALVE PUSH/PULL CABLE (CONT)

- At station 283.00 from buttline 8.0 to buttline 12.0.
- From station 290.0 to station 294.0.
- From station 297.0 to station 303.0.
- From station 313.0 to station 318.0.
- From station 325.0 to station 330.0.
- From station 350.0 to station 360.0.

- Clamp fuel selector valve push/pull cable to fuselage power-available push/pull cable every 6 inches from ENG POWER CONT lever to station 340.00.

NOTE

Keyway on fuel selector valve and control box should be OFF.

- Bolt fuel selector valve push/pull cable and fuselage power available push/pull cable to cockpit overhead with bolts, washers, and bracket halves (Detail A).

STEP 4 REPLACE FUEL SELECTOR VALVE PUSH/PULL CABLE (CONT)

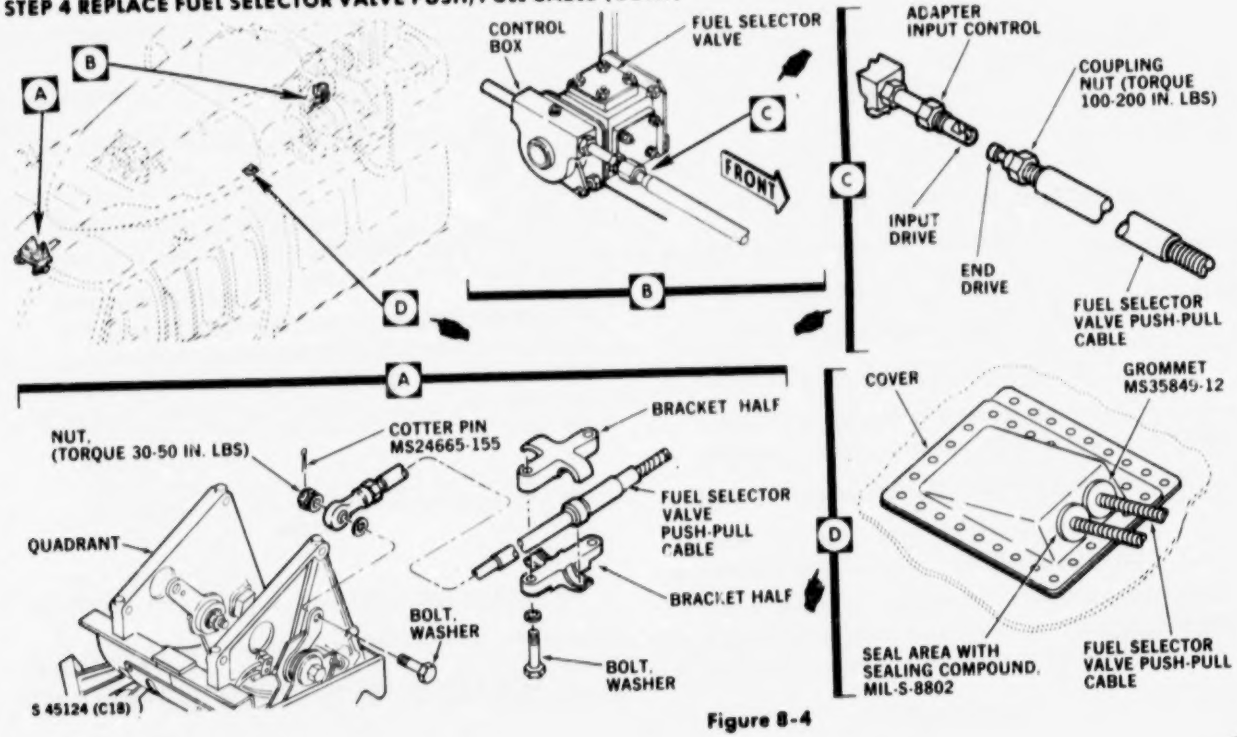

A
B
D
CONTROL BOX
FUEL SELECTOR VALVE
C
FRONT
B
ADAPTER INPUT CONTROL
COUPLING NUT (TORQUE 100-200 IN. LBS)
INPUT DRIVE
END DRIVE
FUEL SELECTOR VALVE PUSH-PULL CABLE
C
A
NUT, (TORQUE 30-50 IN. LBS)
COTTER PIN MS24665-155
BRACKET HALF
FUEL SELECTOR VALVE PUSH-PULL CABLE
QUADRANT
BRACKET HALF
BOLT, WASHER
BOLT, WASHER
S 45124 (C18)
COVER
GROMMET MS35849-12
D
SEAL AREA WITH SEALING COMPOUND, MIL-S-8802
FUEL SELECTOR VALVE PUSH-PULL CABLE

Figure 8-4

STEP 4 REPLACE FUEL SELECTOR VALVE PUSH/PULL CABLE (CONT)

- Clamp fuel selector valve push/pull cable to firewall and structure.

NOTE

Make sure ENG FUEL SYS lever is OFF.

- Thread jamnut and rod end onto fuel selector valve push/pull cable until rod end bearing and fuel selector lever holes line up. **TIGHTEN JAMNUT 1/6 TO 1/3 TURN PAST POINT WHERE SHARP RISE IN TORQUE IS FELT.**
- Bolt fuel selector valve push/pull cable rod end to quadrant fuel selector lever.
- Move fuel selector lever through DIRECT and X FEED positions and check by feel for fuel selector control box detenting in each position.
- **TORQUE NUT TO 30 - 50 INCH-POUNDS.** Install cotter pin, MS24665-155 (Detail A).
- Install cover on quadrant with washers and screws.
- Hinge up upper console and fasten to cockpit overhead by locking fastener studs.
- Install soundproofing in cabin ceiling.
- Close oil cooler compartment access doors.
- Install engine air inlet (TASK 1).
- Close engine cowling and latch.
- Do an operational check (TM 55-1520-237-23-3).

STEP 5 REPLACE FUEL SELECTOR VALVE CONTROL BOX

REMOVE

- Place ENG FUEL SYS lever OFF.
- Open engine cowling.
- Open oil cooler compartment access doors.

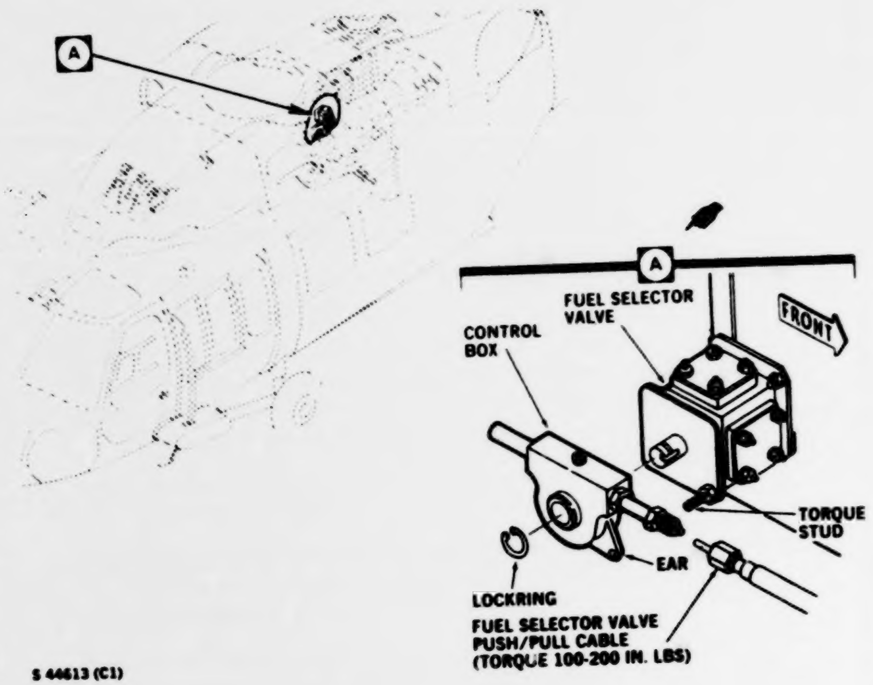
NOTE

The following procedures apply to both left and right side fuel selector control boxes.

- Disconnect fuel selector valve push/pull cable from control box.
- Remove lockring and control box from fuel selector valve.

INSTALL

- Line up keyway on fuel selector valve and control box at OFF. Install control box on fuel selector valve with slot in ear over torque stud. Install lockring.


A
A
FUEL SELECTOR VALVE
CONTROL BOX
FRONT
TORQUE STUD
EAR
LOCKRING
FUEL SELECTOR VALVE PUSH/PULL CABLE (TORQUE 100-200 IN. LBS)

S 44613 (C1)

Figure 8-5

STEP 5 REPLACE FUEL SELECTOR VALVE CONTROL BOX (CONT)

- Connect fuel selector valve push/pull cable to control box. **TORQUE NUT TO 100 - 200 INCH-POUNDS**.
- Move ENG FUEL SYS lever to DIR, XFD, and OFF while an assistant checks to be sure shaft of fuel selector valve turns.
- Check area to be sure it is clean and free of foreign objects.
- Close oil cooler compartment access doors.
- Close engine cowling and latch.

STEP 6 REPLACE ENGINE LOAD-DEMAND PUSH/PULL CABLE SUPPORTS

REMOVE

- Unlatch main rotor pylon sliding cover and slide cover forward.
- Disconnect left/right engine load-demand push/pull cable from support (STEP 1).

NOTE

Removal/installation procedures for left and right supports are the same except as noted.

- Unbolt and remove left/right support from accessory module.
- On support, 70301-02119-101, unbolt and remove clip from support.

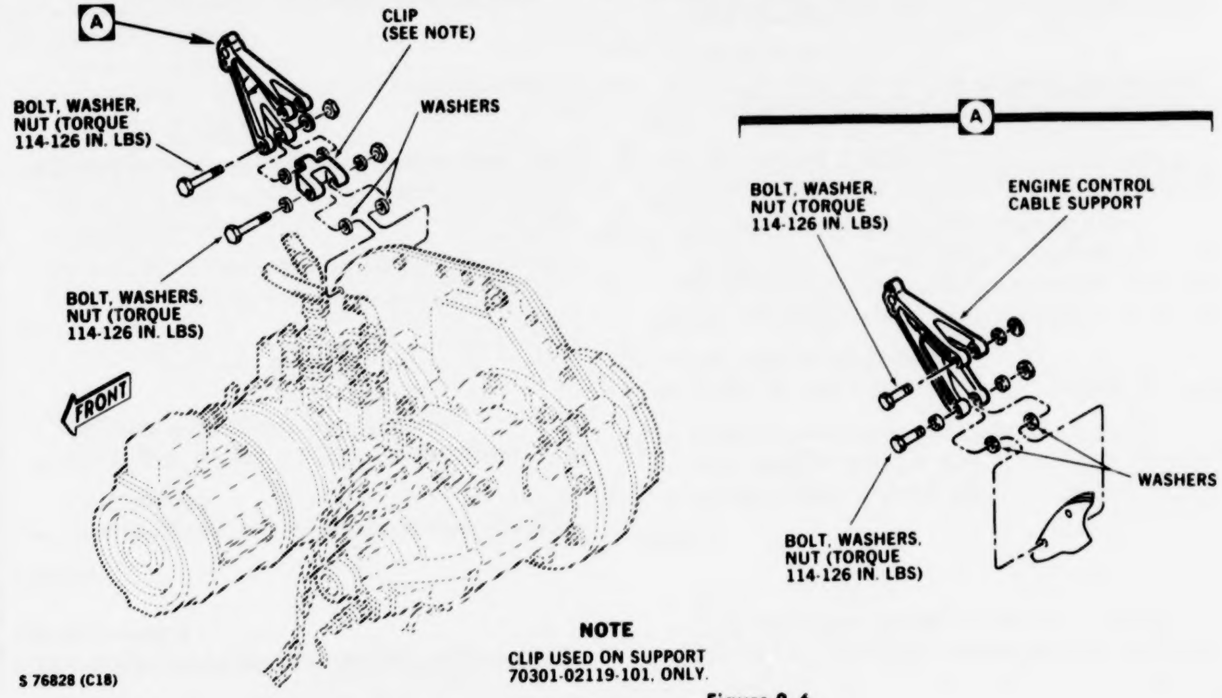
INSPECT

- Inspect clip (TASK 26).
- Fluorescent penetrant inspect support for cracks (TM 43-0103). Replace support if cracks are found.

INSTALL

- Position clip in support, 70301-02119-101, and install washers between clip and lugs of support. Install bolt and washer through support and clip.
- Install washer and nut on bolt. **TORQUE NUT TO 114 - 126 INCH-POUNDS.**
- Position left support, 70301-02119-101, and clip on accessory module. Install washers between lugs of clip and accessory module. Install bolt and washer through clip and accessory module.
- Install washer and nut on bolt. **TORQUE NUT TO 114 - 126 INCH-POUNDS.**
- Install bolt, washers, and nut in upper lugs of support and accessory module. **TORQUE NUT TO 114 - 126 INCH-POUNDS.**
- Position left/right support on accessory module. Install washers between bottom lugs and accessory module. Install bolt and washer through support and accessory module.

STEP 6 REPLACE ENGINE LOAD-DEMAND PUSH/PULL CABLE SUPPORTS (CONT)


A
CLIP
(SEE NOTE)
BOLT, WASHER,
NUT (TORQUE
114-126 IN. LBS)
WASHERS
BOLT, WASHERS,
NUT (TORQUE
114-126 IN. LBS)
FRONT
A
BOLT, WASHER,
NUT (TORQUE
114-126 IN. LBS)
ENGINE CONTROL
CABLE SUPPORT
WASHERS
BOLT, WASHERS,
NUT (TORQUE
114-126 IN. LBS)
S 76828 (C18)

NOTE

CLIP USED ON SUPPORT 70301-02119-101, ONLY.

Figure 8-6

STEP 6 REPLACE ENGINE LOAD-DEMAND PUSH/PULL CABLE SUPPORTS (CONT)

- Install washer and nut on bolt. **TORQUE NUT TO 114 - 126 INCH-POUNDS.**
- Install bolt, washers, and nut in upper lugs of support and accessory module. **TORQUE NUT TO 114 - 126 INCH-POUNDS.**
- Connect left/right engine load-demand push/pull cable to support (STEP 1).
- Check area for cleanness and foreign material.
- Slide main rotor pylon sliding cover closed and latch.

TASK 9

ENGINE AIR INLET ANTI-ICE - MAINTAIN

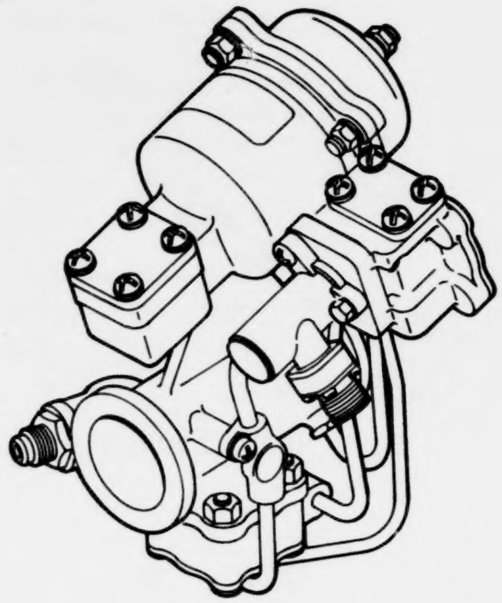
- **REPLACE AIR INLET ANTI-ICING VALVE - STEP 1**
- **REPLACE THERMAL SWITCH - STEP 2**

PERSONNEL REQUIRED
- One Person Required: MOS 67T - Tactical Transport Helicopter Repairer

SUPPLIES
- Grommet, MS35489-11 (1 Required, STEPS 1, 2)
- Lockwire, MS20995NC32 (STEP 2)

TOOLS
- Aircraft Mechanic's Toolkit, NSN 5180-00-323-4692

ALSO NEEDED
- TM 55-1520-237-23-3

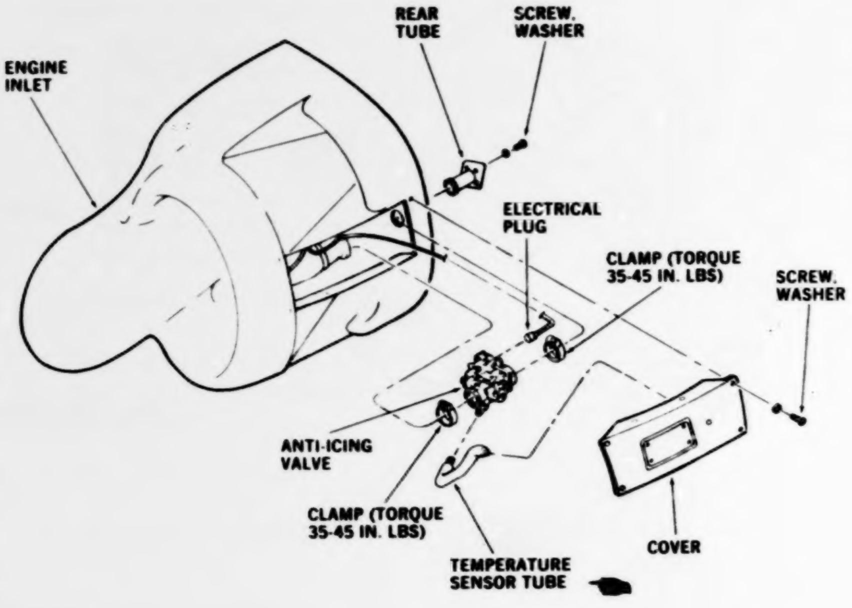


S 45125 (B)

STEP 1 REPLACE AIR INLET ANTI-ICING VALVE

REMOVE

- Turn off all electrical power.
- Open engine cowling.
- Remove screws and cover on engine air inlet. Be careful not to damage temperature sensor hose/tube, when removing cover.
- Disconnect temperature sensor hose/tube from cover, as follows:
  - When temperature sensor hose, Part No. AE7012G0114-080, is installed, disconnect hose from fitting or cover.
  - When temperature sensor tube, Part No. 70306-10019-041 or -042, is installed, slip tube out of grommet on cover. Replace grommet, if damaged.
- Disconnect temperature sensing hose/tube from anti-icing valve.
- Keep hose/tube with cover for installation.
- Disconnect electrical plug from anti-icing valve.


REAR TUBE
SCREW, WASHER
ENGINE INLET
ELECTRICAL PLUG
CLAMP (TORQUE 35-45 IN. LBS)
SCREW, WASHER
ANTI-ICING VALVE
CLAMP (TORQUE 35-45 IN. LBS)
TEMPERATURE SENSOR TUBE
COVER

S 45126 (C15)

Figure 9-1

STEP 1 REPLACE AIR INLET ANTI-ICING VALVE (CONT)

- Unclamp anti-icing valve from air inlet tubes.
- Remove screws and rear tube from engine air inlet, and remove valve from inlet.

INSTALL

- Turn off all electrical power.
- Place anti-icing valve in air inlet and install rear tube with washers and screws.

NOTE

Make sure flow arrow on valve is pointing in direction of airflow.

- Connect anti-icing valve to air inlet tubes with clamps. **TORQUE CLAMP TO 35 - 45 INCH-POUNDS.**
- Connect temperature sensor hose/tube as follows:
  - When temperature sensor hose, Part No. AE7012-G0114-080, is installed, connect hose to anti-icing valve and fitting on cover.
  - When temperature sensor tube, Part No. 70306-10019-041 or -042, is installed, connect tube to anti-icing valve. Make sure that end of tube is in position to slip into grommet on cover, when cover is installed.
- Connect electrical plug to anti-icing valve.
- Check area to be sure it is free of foreign objects; then install cover on engine air inlet with washers and screws.
- Close engine cowling.
- Do an operational check (TM 55-1520-237-23-3).

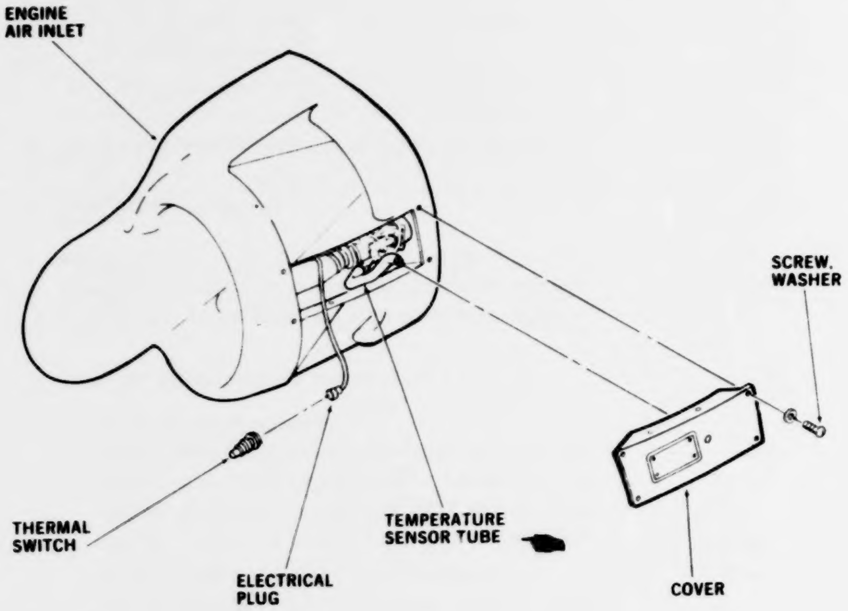
STEP 2 REPLACE THERMAL SWITCH

REMOVE

- Turn off all electrical power.
- Remove screws and cover on engine air inlet.
- Disconnect temperature sensor hose/tube from cover, as follows:
  - When temperature sensor hose, Part No. AE7012G0114-080, is installed, disconnect hose from fitting on cover.
  - When temperature sensor tube, Part No. 70306-10019-041 or -042, is installed, slip tube out of grommet on cover. Replace grommet, if damaged.
- Disconnect electrical plug from thermal switch.
- Remove thermal switch from engine air inlet.

INSTALL

- Turn off all electrical power.


ENGINE AIR INLET
SCREW, WASHER
THERMAL SWITCH
TEMPERATURE SENSOR TUBE
ELECTRICAL PLUG
COVER

S 45127 (C15)

Figure 9-2

STEP 2 REPLACE THERMAL SWITCH (CONT)

- Install thermal switch in engine air inlet.
- Lockwire, MS20995NC32, electrical plug to thermal switch. Connect electrical plug to thermal switch.
- Check area to be sure it is free of foreign objects.
- Connect temperature sensor hose/tube to fitting on cover as follows:
  - When temperature sensor hose, Part No. AE7012G0114-080, is installed, connect hose to fitting on cover.
  - When temperature sensor tube, Part No. 70306-10019-041 or -042, is installed, slip tube into grommet on cover.
- Install cover on engine air inlet with washers and screws.
- Do an operational check (TM 55-1520-237-23-3).

TASK 10

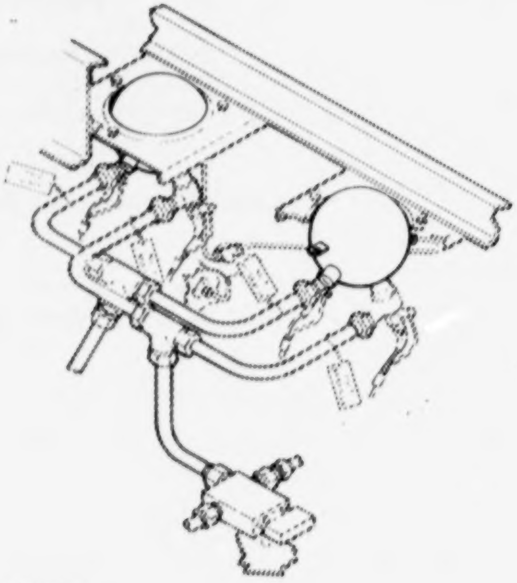
FIRE EXTINGUISHING SYSTEM - MAINTAIN

- **REPLACE EXTINGUISHING AGENT CONTAINER - STEP 1**
- **PRESERVE CONTAINER - STEP 2**
- **REPLACE CARTRIDGE - STEP 3**
- **REPLACE CHECK VALVE - STEP 4**
- **REPLACE THERMAL DISC - STEP 5**
- **REPLACE DISCHARGE TUBES - STEP 6**
- **REPLACE DIRECTIONAL VALVE - STEP 7**

PERSONNEL REQUIRED
- One Person Required: MOS 67T - Tactical Transport Helicopter Repairer

SUPPLIES
- Antiseize Compound, MIL-A-907 (STEP 1)
- Lockwire, MS20995NC32 (STEP 3)
- Packing, MS28778-5 (STEP 3)

TOOLS
- Aircraft Mechanic's Toolkit, NSN 5180-00-323-4692
- Open End Wrench, 1-1/16 x 1-1/4-inch, NSN 5120-00-187-7134 (STEP 3)



S 45128 (B)

TOOLS (CONT)
- Torque Wrench, 0-30 in. lbs, NSN 5120-00-117-4832 (STEP 3)
- Torque Wrench, 30 - 150 in. lbs, NSN 5120-00-542-4489 (STEPS 1, 7)
- Torque Wrench, 150 - 750 in. lbs, NSN 5120-00-821-3441 (STEP 3)

ALSO NEEDED
- Protective Caps (STEPS 1, 2, 6)
- Protective Plugs (STEPS 1, 2, 4, 7)
- Tags (STEPS 1, 6)
- TM 55-1520-237-23-1 (STEP 3)
- TM 55-1520-237-23-2 (STEP 3)
- TM 55-1520-237-23-3 (STEPS 3, 7)

STEP 1 REPLACE EXTINGUISHING AGENT CONTAINER

REMOVE

NOTE

The following procedures apply to both main and reserve containers.

- Turn off all electrical power.
- Hinge open APU compartment door on right side of helicopter.
- Disconnect electrical wiring from cartridge on either discharge outlet. Tag manifold tube to discharge outlet with same identification as removed wiring.

WARNING

To prevent injury to personnel or damage to equipment, make sure shorting jumper is installed before removing cartridge.

- Connect shorting jumper between cartridge power and ground terminals.
- Disconnect wiring from cartridge on other discharge outlet, and tag manifold tube in same manner.

STEP 1 REPLACE EXTINGUISHING AGENT CONTAINER (CONT)

WARNING

To prevent injury to personnel or damage to equipment, make sure shorting jumper is installed before removing cartridge.

- Connect shorting jumper between cartridge power and ground terminals.

WARNING

To prevent injury to personnel or damage to equipment, do not loosen fill/relief or discharge outlet valves if container is pressurized.

- Disconnect overboard discharge tube from container fill/thermal relief outlet. Plug tube.
- Disconnect manifold tubes from container discharge outlets. Plug tubes.
- Unbolt and remove container from support. Cap discharge outlets and fill/thermal relief outlet.
- Preserve container (STEP 2).

INSTALL

- Install new cartridges (STEP 3).
- Weigh container with discharge outlets and cartridges installed. **WEIGHT WITH EXTINGUISHING AGENT AND CHARGES SHOULD NOT DIFFER MORE THAN 0.05 POUNDS FROM THAT ON DECAL WHEN LAST CHARGED.** If gage pressure or weight is below limits specified on decal, replace container.

STEP 1 REPLACE EXTINGUISHING AGENT CONTAINER (CONT)

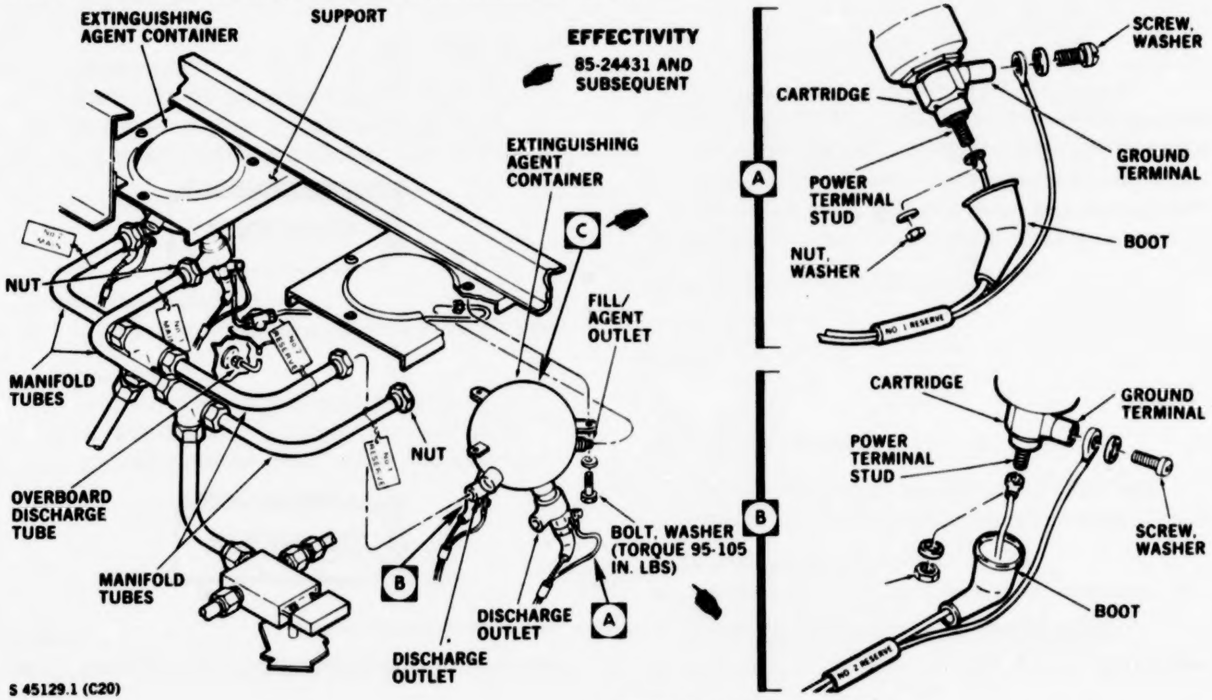
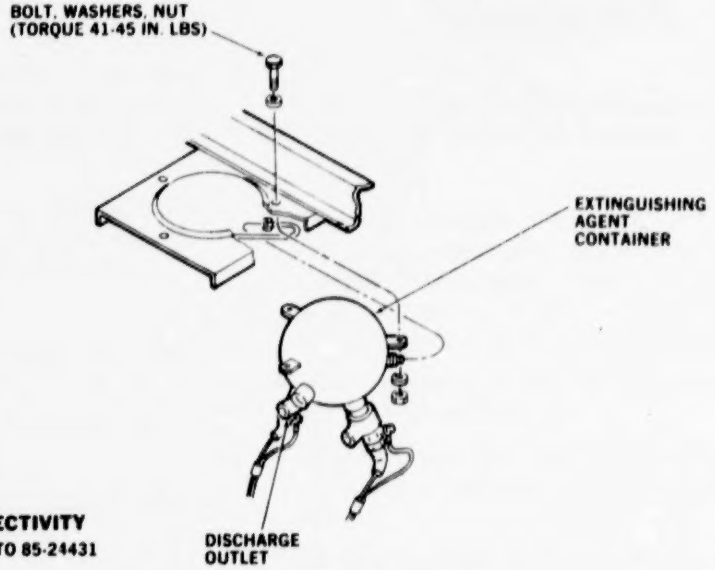

EXTINGUISHING AGENT CONTAINER
SUPPORT
EFFECTIVITY
85-24431 AND SUBSEQUENT
EXTINGUISHING AGENT CONTAINER
C
NUT
MANIFOLD TUBES
FILL/ AGENT OUTLET
NUT
OVERBOARD DISCHARGE TUBE
BOLT, WASHER (TORQUE 95-105 IN. LBS)
MANIFOLD TUBES
B
B
DISCHARGE OUTLET
A
DISCHARGE OUTLET
A
CARTRIDGE
SCREW, WASHER
GROUND TERMINAL
POWER TERMINAL STUD
NUT, WASHER
BOOT
NO 1 RESERVE
B
CARTRIDGE
GROUND TERMINAL
POWER TERMINAL STUD
SCREW, WASHER
BOOT
NO 2 RESERVE
S 45129.1 (C20)

Figure 10-1 (Sheet 1 of 2)

STEP 1 REPLACE EXTINGUISHING AGENT CONTAINER (CONT)


BOLT, WASHERS, NUT
(TORQUE 41-45 IN. LBS)
EXTINGUISHING AGENT CONTAINER
DISCHARGE OUTLET

EFFECTIVITY
PRIOR TO 85-24431

C

S 45129.2 (C20)

Figure 10-1 (Sheet 2 of 2)

STEP 1 REPLACE EXTINGUISHING AGENT CONTAINER (CONT)

- Turn off all electrical power.
- On helicopter Serial No. 85-24431 and subsequent, bolt container to nut plates on support with bolts and washers. **TORQUE BOLTS TO 95 - 105 INCH-POUNDS.**
- On helicopters prior to Serial No. 85-24431, bolt container to support with bolts, washers, and nuts. **TORQUE NUTS TO 41 - 45 INCH-POUNDS.**
- Remove caps from container.
- Coat threads on container discharge outlets with antiseize compound, MIL-A-907.
- Unplug and connect manifold tubes to container discharge outlets.
- Unplug and connect overboard discharge tube to container.
- Do an operational check of fire extinguishing system (TM 55-1520-237-23-3).
- Remove shorting jumper between cartridge power and ground terminals.

WARNING

To make certain electrical wires are not crossed, refer to TM 55-1520-237-23-3.

- Match No. 1 MAIN or No. 1 RESERVE electrical wiring to manifold tube tagged with same identification. Connect braided wire to cartridge power terminal stud and install boot. Connect ground wire to ground terminal with screw and washer.
- Remove shorting jumper between cartridge power and ground terminals.
- Connect No. 2 MAIN or No. 2 RESERVE electrical wiring to cartridge in same manner used for No. 1.
- Remove tags from manifold tubes.
- Make sure compartment area is free of foreign objects.
- Close and latch APU compartment door.

STEP 2 PRESERVE CONTAINER

PRESERVE

- Remove container from helicopter (STEP 1).

CAUTION

Make sure firing cartridge has been removed before packing.

- Remove cartridge from container (STEP 3).
- Cap main and thermal fittings on container.
- Plug firing cartridge hole.
- Pack in carton large enough to allow for 1 inch of cushioning around container.

STEP 3 REPLACE CARTRIDGE

REMOVE

NOTE

The following procedures apply to all four cartridges in the fire extinguishing system.

- Turn off all electrical power.

- Hinge open APU compartment door on right side of helicopter.

- Disconnect electrical wiring from cartridge terminals.

STEP 3 REPLACE CARTRIDGE (CONT)

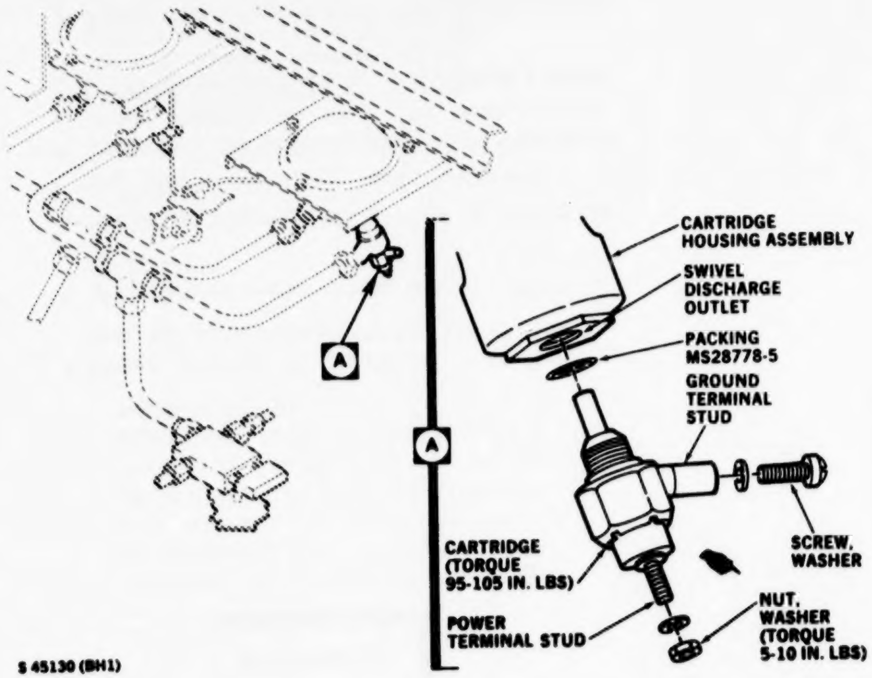
WARNING

To prevent injury to personnel or damage to equipment, make sure shorting jumper is installed before removing cartridge.

- Connect shorting jumper between cartridge power terminal stud and ground terminal.

WARNING

To prevent injury to personnel or damage to equipment, do not loosen cartridge housing assembly if container is pressurized.


A
A
CARTRIDGE HOUSING ASSEMBLY
SWIVEL DISCHARGE OUTLET
PACKING MS28778-5
GROUND TERMINAL STUD
SCREW, WASHER
CARTRIDGE (TORQUE 95-105 IN. LBS)
POWER TERMINAL STUD
NUT, WASHER (TORQUE 5-10 IN. LBS)

S 45130 (BH1)

Figure 10-2

STEP 3 REPLACE CARTRIDGE (CONT)

- Hold housing assembly with wrench, NSN 5120-00-187-7134, and remove cartridge without loosening housing assembly.

- Inspect electrical wiring for fraying, security, and general condition. Replace wiring if necessary (TM 55-1520-237-23-1).

INSTALL

- Turn off all electrical power.

WARNING

Do not remove protective cover until after cartridge has been installed in housing assembly of fire extinguisher container.

WARNING

To prevent injury to personnel or damage to equipment, use cartridge, 70310-03101-105 with fire extinguisher bottle, 70310-03101-106 or 70310-03101-101. Use cartridge, 70310-03101-107 with fire extinguisher bottle, 70310-03101-108 or 70310-03101-101.

- Check cartridge for installation, manufacturing date, and serviceability (TM 55-1520-237-23-2).
- Hold housing assembly with wrench, NSN 5120-00-187-7134.
- Install new packing (MS28778-5) on serviceable cartridge.
- Install cartridge in housing assembly on discharge outlet. **TORQUE TO 95 - 105 INCH-POUNDS.** Lockwire, MS20995NC32, cartridge to housing assembly. Remove protective cover.
- Remove shorting jumper between cartridge power terminal stud and ground terminal.

STEP 3 REPLACE CARTRIDGE (CONT)

WARNING

To make certain electrical wires are not crossed, refer to TM 55-1520-237-23-1.

- Connect electrical wiring to cartridge terminals. **TORQUE NUT TO 5 - 10 INCH-POUNDS.**
- Do an operational check of fire extinguishing system (TM 55-1520-237-23-3).
- Check area to be sure it is free of foreign objects, then close and latch APU compartment door.

STEP 4 REPLACE CHECK VALVE

REMOVE

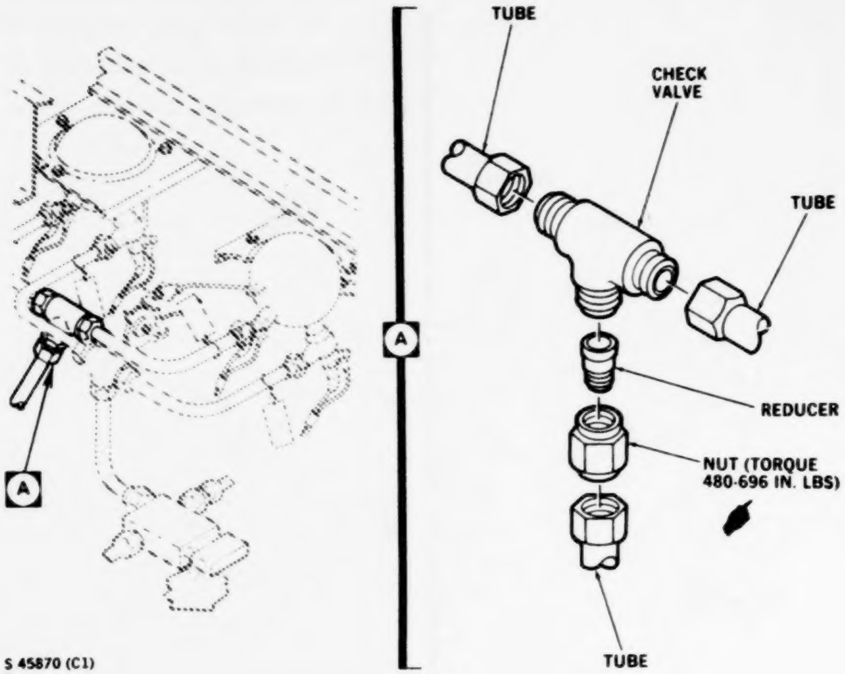
NOTE

> The following procedures apply to both check valves in the fire extinguishing system.

- Turn off all electrical power.
- Hinge open APU compartment door on right side of helicopter.
- Disconnect tubes from check valve. Plug tubes.
- Remove nut and reducer from check valve.

INSTALL

- Install reducer and nut on check valve. **TORQUE NUT TO 480 - 696 INCH-POUNDS.**
- Unplug and connect tubes to check valve. Tighten 1/3 to 1/6 turn past point where sharp rise in torque is felt.
- Check area to be sure it is free of foreign objects, then close and latch APU compartment door.



S 45870 (C1)

Figure 10-3

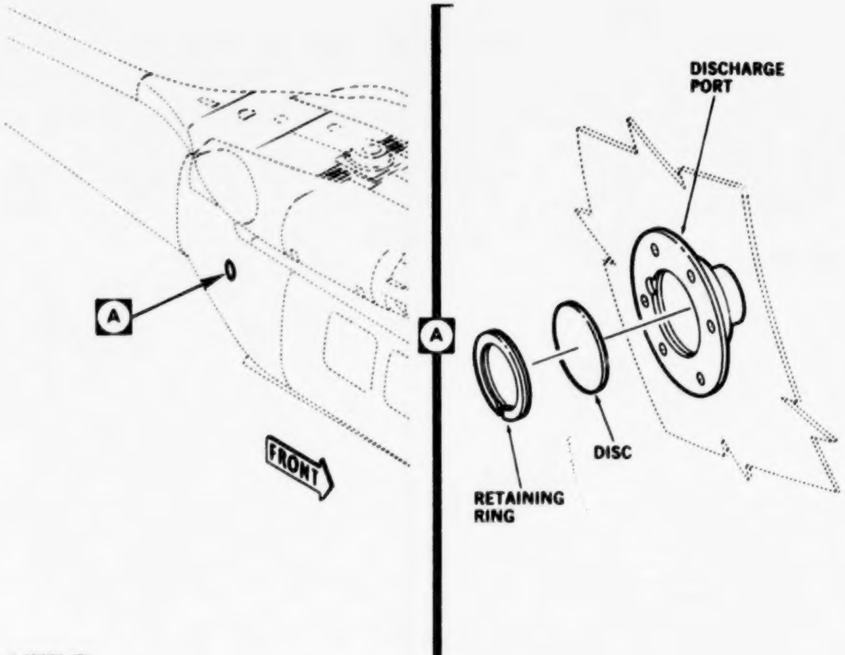
STEP 5 REPLACE THERMAL DISC

REMOVE

- Remove retaining ring and thermal disc from discharge port of indicator body on right side of helicopter.

INSTALL

- Install new thermal disc and retaining ring in discharge port of indicator body.


A
FRONT
A
DISCHARGE PORT
DISC
RETAINING RING

S 45871 (B)

Figure 10-4

STEP 6 REPLACE DISCHARGE TUBES

REMOVE

- Turn off all electrical power.
- Hinge open engine, oil cooler, and APU compartment doors as required.
- Disconnect tubes. Remove clamps.
- Remove tubes. Cap tubes and ports.

STEP 6 REPLACE DISCHARGE TUBES (CONT)

- Deleted.

INSPECT

- Check for dents or distortion in tubes. Replace tube if dents are:
  - **DEEPER THAN 0.080-INCH.**
  - **WITHIN 4-INCHES OF EACH OTHER.**

INSTALL

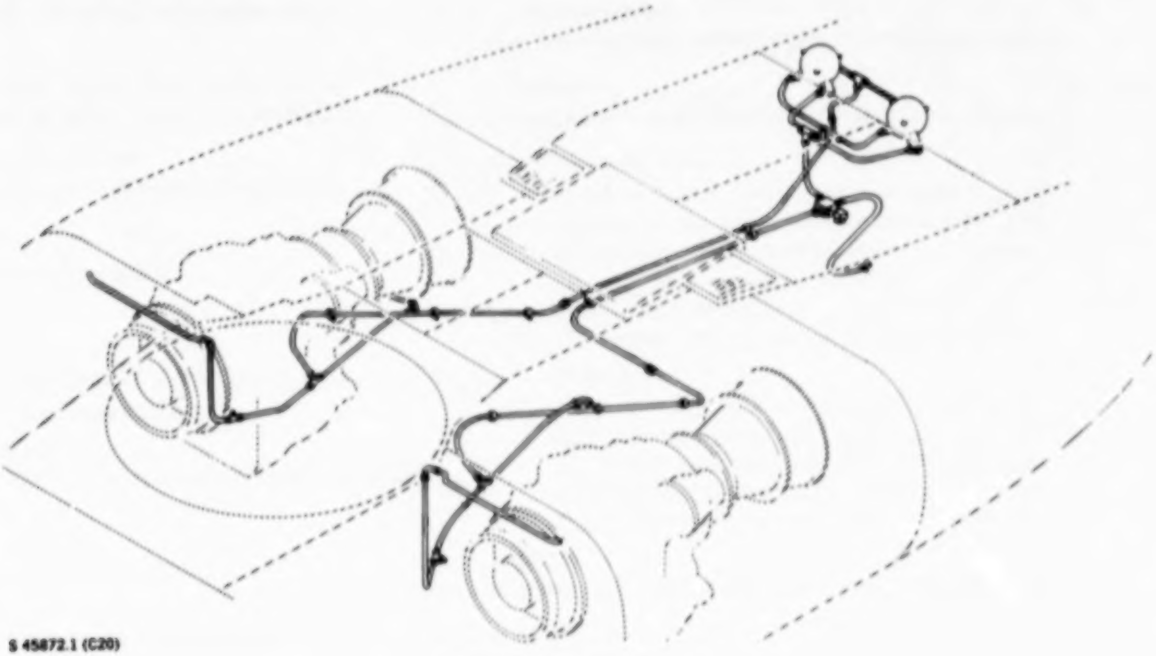
- Turn off all electrical power.

NOTE

- Make sure tube to be installed is clear of any obstructions.
- Tighten all B-nuts 1/6 - 1/3 turn beyond point where sharp rise in torque is felt.

- Remove caps and install and connect tubes.
- Install clamps.
- Make sure discharge tubes are positioned as follows:
  - The target point at which the left-hand discharge tube should aim is 1-1/2-inches up from the engine-mounted fuel filter base and 3/8-inch inboard of fuel filter centerline. The target zone is a 2-inch diameter circle around the target point.
  - The target point at which the right-hand discharge tube should aim is 5-1/2-inches aft of the air inlet firewall, measured along the engine inlet duct bleed air line, and 3/8-inch inboard of the bleed air line centerline. The target zone is a 2-inch diameter circle around the target point.
- Make sure compartment area is free of foreign objects.
- Close and latch engine, oil cooler, and APU compartment doors.

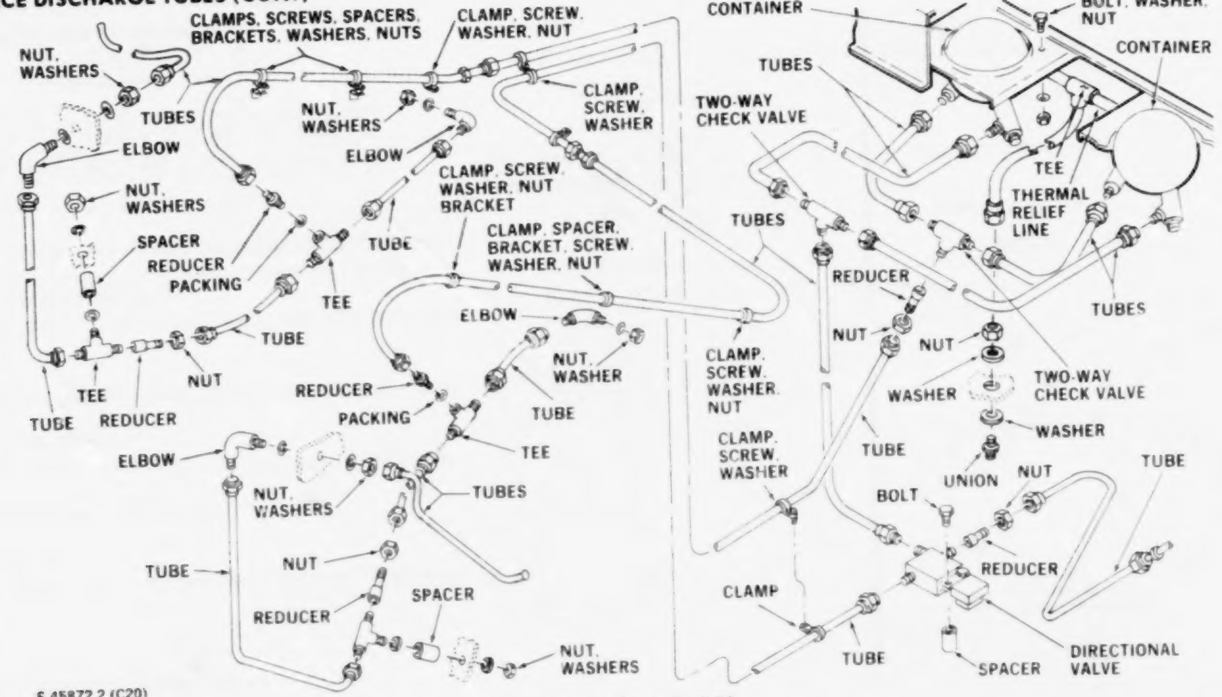
STEP 6 REPLACE DISCHARGE TUBES (CONT)



S 45872.1 (C20)

Figure 10-5 (Sheet 1 of 2)

STEP 6 REPLACE DISCHARGE TUBES (CONT)


CLAMPS, SCREWS, SPACERS, BRACKETS, WASHERS, NUTS
CLAMP, SCREW, WASHER, NUT
NUT, WASHERS
TUBES
ELBOW
NUT, WASHERS
SPACER
REDUCER
PACKING
TEE
TUBE
TEE
REDUCER
NUT
TUBE
NUT, WASHERS
ELBOW
TUBE
CLAMP, SCREW, WASHER
CLAMP, SCREW, WASHER, NUT BRACKET
CLAMP, SPACER, BRACKET, SCREW, WASHER, NUT
ELBOW
NUT, WASHER
REDUCER
PACKING
TUBE
TEE
ELBOW
NUT, WASHERS
TUBES
TUBE
NUT
REDUCER
SPACER
NUT, WASHERS
CONTAINER
BOLT, WASHER, NUT
CONTAINER
TUBES
TWO-WAY CHECK VALVE
TUBES
TEE
THERMAL RELIEF LINE
REDUCER
NUT
NUT
TUBES
CLAMP, SCREW, WASHER, NUT
WASHER
TWO-WAY CHECK VALVE
WASHER
CLAMP, SCREW, WASHER
TUBE
UNION
NUT
TUBE
BOLT
REDUCER
CLAMP
TUBE
SPACER
DIRECTIONAL VALVE

S 45872 2 (C20)

Figure 10-5 (Sheet 2 of 2)

STEP 7 REPLACE DIRECTIONAL VALVE

REMOVE

- Hinge open APU compartment door on right side of helicopter.
- Turn off all electrical power.
- Tag and disconnect wires from terminal block on directional valve.
- Disconnect tubes from directional valve. Plug tubes.
- Remove bolts, directional valve, and spacers from APU compartment deck.
- Remove nut and reducer from directional valve.

NOTE

Tighten all "B" nuts 1/6 to 1/3 turn past point where sharp rise in torque is felt.

INSTALL

- Turn off all electrical power.
- Install reducer and nut on directional valve.

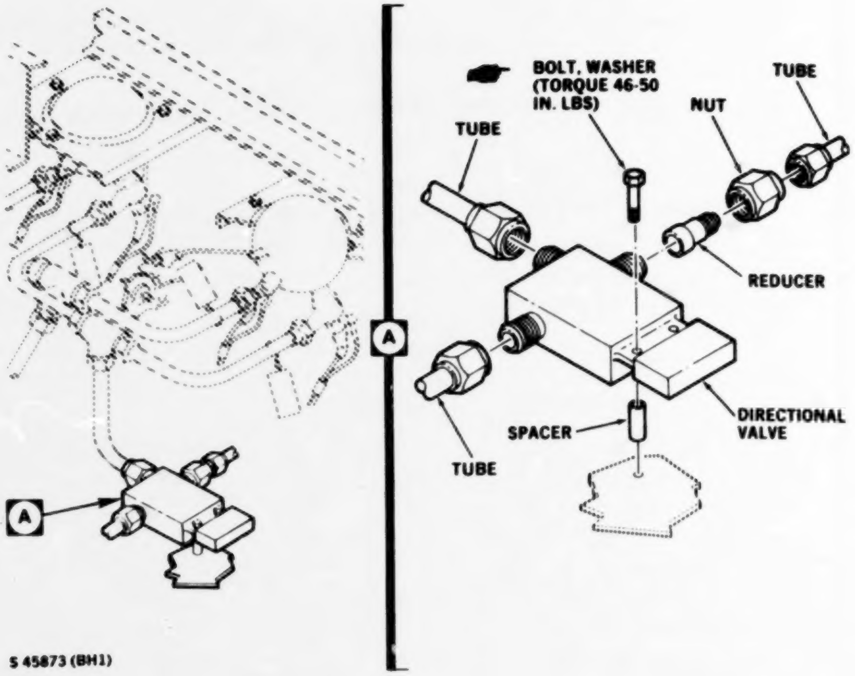

A
S 45873 (BH1)
BOLT, WASHER (TORQUE 46-50 IN. LBS)
TUBE
TUBE
NUT
REDUCER
A
DIRECTIONAL VALVE
SPACER
TUBE

Figure 10-6

STEP 7 REPLACE DIRECTIONAL VALVE (CONT)

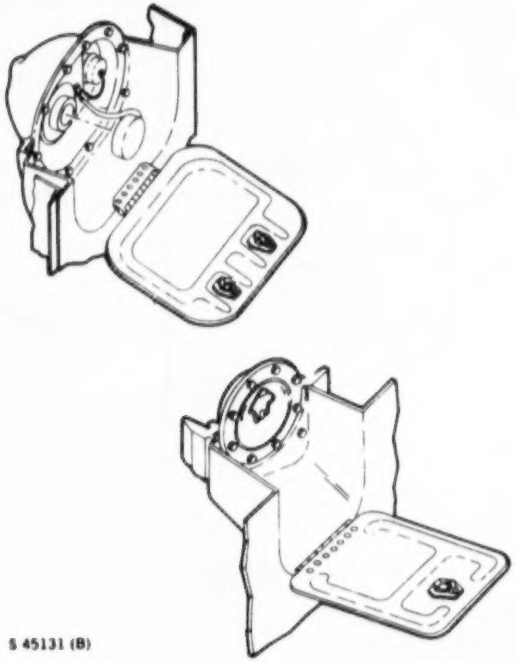
CAUTION

Mount valve so that normally-open port (small diameter) faces No. 1 engine tube, and normally-closed port faces APU tube (reducer faces rear).

- Install directional valve on APU compartment deck with spacers and bolts. **TORQUE BOLTS TO 46 - 50 INCH-POUNDS.**
- Unplug and connect tubes to directional valve.
- Remove tags and connect wires to terminal block on directional valve.
- Do an operational check of directional valve (TM 55-1520-237-23-3).
- Check area to be sure it is free of foreign objects, then close and latch APU compartment door.

TASK 11

REFUEL AND DEFUEL



S 45131 (B)

- **PRESSURE DEFUEL - STEP 1**
- **GRAVITY DEFUEL - STEP 2**
- **PRESSURE REFUEL - STEP 3**
- **GRAVITY REFUEL - STEP 4**
- **CLOSED CIRCUIT REFUEL - STEP 5**

PERSONNEL REQUIRED
- One Person Required: MOS 67T - Tactical Transport Helicopter Repairer

SUPPLIES
- Fuel, Grade JP4 or JP5 MIL-T-5624 (STEPS 3, 4, 5)

TOOLS
- Probe, 70307-03018-102 (STEP 2)

ALSO NEEDED
- Clamp, AN737-TW58 (STEP 2)
- Flex Hose for attachment to Probe (STEP 2)
- Suitable Container for draining fuel (STEP 2)
- FM 10-68
- FM 10-69

STEP 1 PRESSURE DEFUEL

PREPARE TO DEFUEL

WARNING

In addition to these procedures, follow all procedures for fuel servicing given in FM 10-68 and FM 10-69.

- Turn off all electrical power.
- Connect static ground cable to lower stage air valve on shock strut.
- Plug fuel nozzle ground into ground receptacle on helicopter fuselage left side.
- Open access cover.
- Remove cap from refuel/defuel adapter.
- Connect fuel nozzle to refuel/defuel adapter.

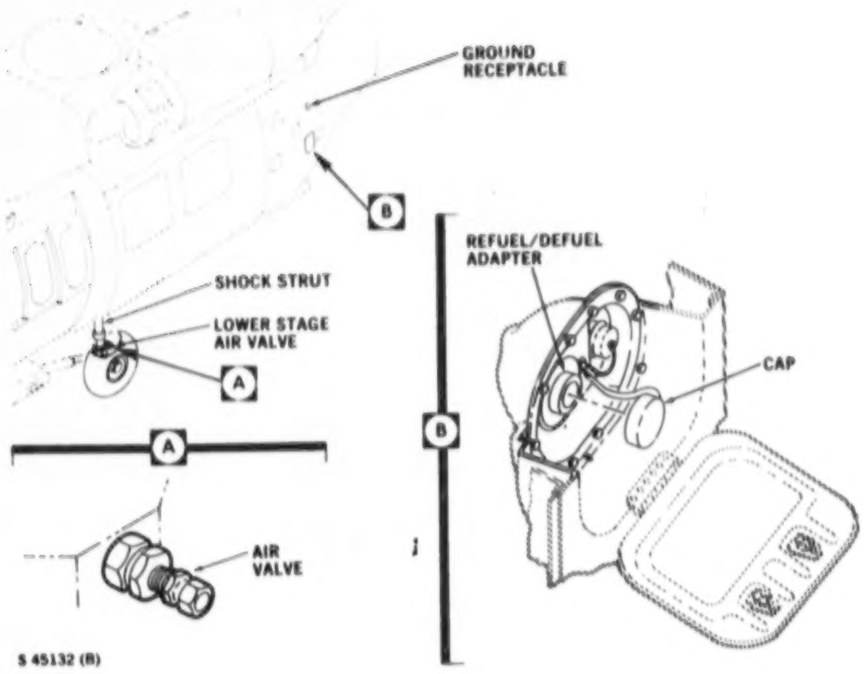

GROUND RECEPTACLE
B
SHOCK STRUT
LOWER STAGE AIR VALVE
A
A
AIR VALVE
S 45132 (B)
B
REFUEL/DEFUEL ADAPTER
CAP

Figure 11-1

STEP 1 PRESSURE DEFUEL (CONT)

DEFUEL

- Start defueling system and defuel cells at 3 psi negative pressure (suction).

NOTE

When tanks are defueled, some fuel will remain in tank sumps. If necessary to remove remaining fuel, drain fuel from sumps (STEP 2).

- Turn off defueling system.
- Remove fuel nozzle from refuel/defuel adapter.
- Install cap on refuel/defuel adapter.
- Close access cover.
- Unplug fuel nozzle ground from ground receptacle on helicopter fuselage.

STEP 2 GRAVITY DEFUEL

PREPARE TO DEFUEL

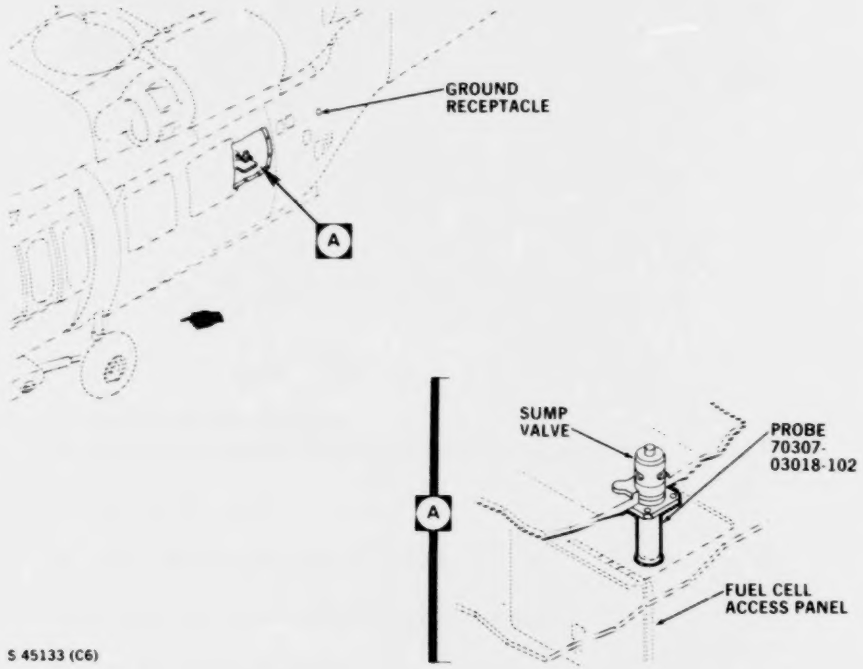
WARNING

In addition to these procedures, follow all procedures for fuel servicing given in FM 10-68 and FM 10-69.

NOTE

When gravity defueling, each fuel cell is done separately.

- Turn off all electrical power.
- Clamp suitable length of flex hose to probe, 70307-03018-102, with clamp, AN737-TW58, or equivalent.
- Connect static ground cable to ground receptacle.
- Open fuel cell access panel on underside of helicopter fuselage.
- Place end of flex hose in a suitable container to catch draining fuel.


GROUND RECEPTACLE
A
A
SUMP VALVE
PROBE 70307-03018-102
FUEL CELL ACCESS PANEL

S 45133 (C6)

Figure 11-2

STEP 2 GRAVITY DEFUEL (CONT)

DEFUEL

- Place probe, 70307-03018-102, in sump valve, push up, and twist.
- Remove probe from sump valve when tank is empty.
- Close fuel cell access panel on underside of helicopter fuselage.
- Deleted

STEP 3 PRESSURE REFUEL

PREPARE TO REFUEL

WARNING

In addition to these procedures, follow all procedures for fuel servicing given in FM 10-68 and FM 10-69.

- Turn off all electrical power.
- Park helicopter on level ground.
- Connect static ground cable to lower stage air valve on shock strut.
- Connect static ground cable to servicing unit.
- Connect ground cable between helicopter and servicing unit.
- Plug fuel nozzle ground into ground receptacle on helicopter fuselage.

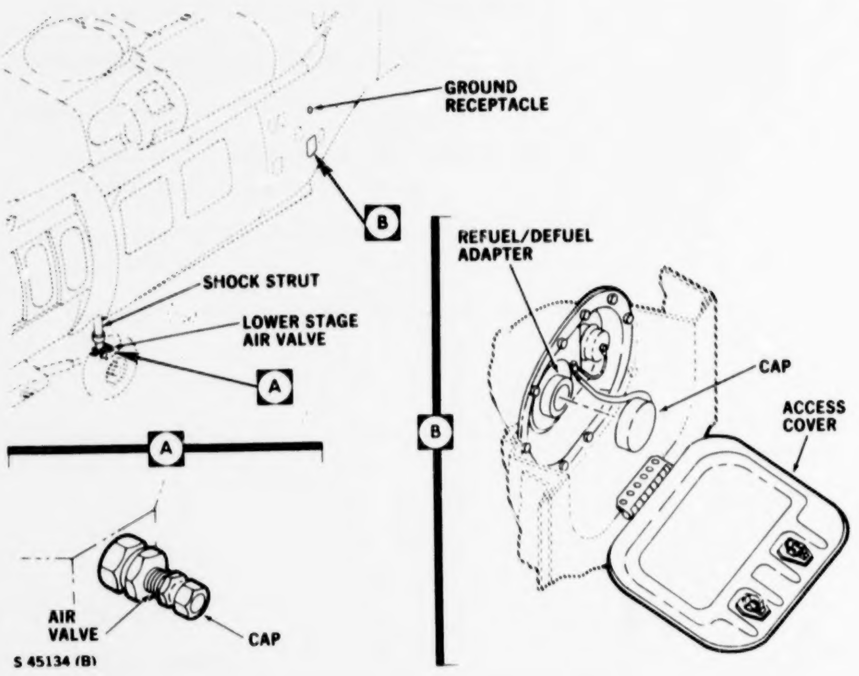

GROUND RECEPTACLE
B
SHOCK STRUT
LOWER STAGE AIR VALVE
A
A
AIR VALVE
CAP
S 45134 (B)
B
REFUEL/DEFUEL ADAPTER
CAP
ACCESS COVER

Figure 11-3

STEP 3 PRESSURE REFUEL (CONT)

- Open access cover.
- Remove cap from refuel/defuel adapter.
- Connect fuel nozzle to refuel/defuel adapter.
- Set refueling pumping system to provide a line pressure of 55 psi.

REFUEL

- Start refueling system and fuel helicopter.
- Turn off refueling system when no flow is indicated.
- Remove fuel nozzle from refuel/defuel adapter.
- Install cap on refuel/defuel adapter.
- Close access cover.
- Unplug fuel nozzle ground from ground receptacle on helicopter fuselage.
- Disconnect ground cable between helicopter and servicing unit.
- Disconnect static ground cable from servicing unit.

STEP 4 GRAVITY REFUEL

PREPARE TO REFUEL

WARNING

In addition to these procedures, follow all procedures for fuel servicing given in FM 10-68 and FM 10-69.

NOTE

When gravity refueling, each fuel cell must be filled separately. The following procedures apply to both fuel cells.

- Turn off all electrical power.
- Park helicopter on level ground.
- Connect static ground cable to lower stage air valve on shock strut.

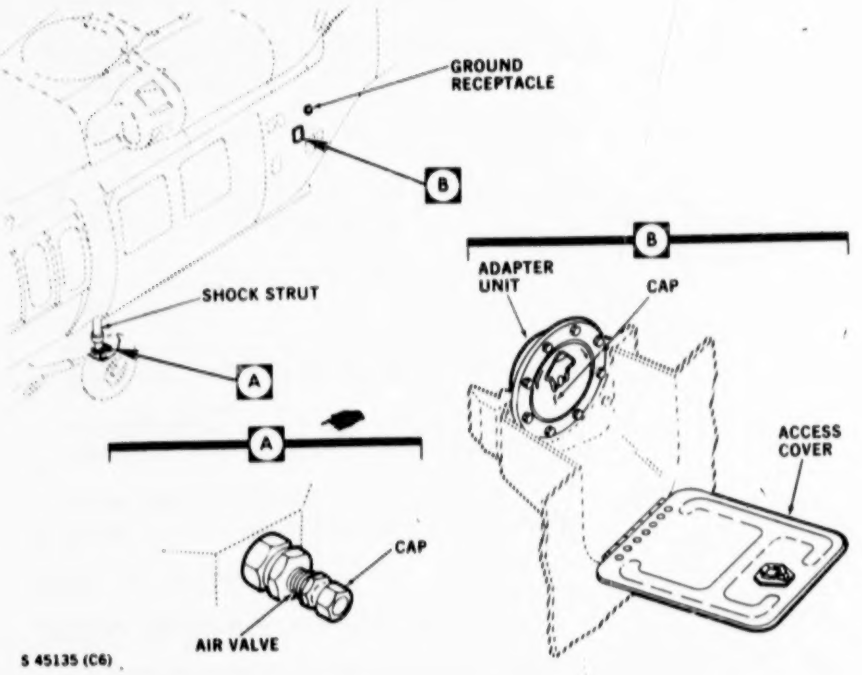

GROUND RECEPTACLE
B
SHOCK STRUT
A
A
CAP
AIR VALVE
S 45135 (C6)
B
ADAPTER UNIT
CAP
ACCESS COVER

Figure 11-4

STEP 4 GRAVITY REFUEL (CONT)

- Connect static ground cable to servicing unit.
- Connect ground cable between helicopter and servicing unit.
- Plug fuel nozzle ground into ground receptacle on helicopter fuselage.
- Open access cover.
- Remove cap from adapter unit.

REFUEL

- Start refueling system and fuel helicopter. Look into tank to check fuel level.
- Turn off refueling system when you have enough fuel.
- Remove fuel nozzle from adapter unit.
- Install cap on adapter unit with arrow pointing to front of helicopter.
- Close access cover.
- Unplug hose fuel nozzle ground from ground receptacle on helicopter fuselage.
- Disconnect ground cable between helicopter and servicing unit.
- Disconnect static ground cable from servicing unit.

STEP 5 CLOSED CIRCUIT REFUEL

PREPARE TO REFUEL

WARNING

In addition to these procedures, follow all procedures for fuel servicing given in FM 10-68 and FM 10-69.

- Turn off all electrical power.
- Park helicopter on level ground.
- Connect static ground cable to lower stage air valve on shock strut.
- Connect static ground cable to servicing unit.
- Connect ground cable between helicopter and servicing unit.
- Plug fuel nozzle ground into ground receptacle on helicopter fuselage.

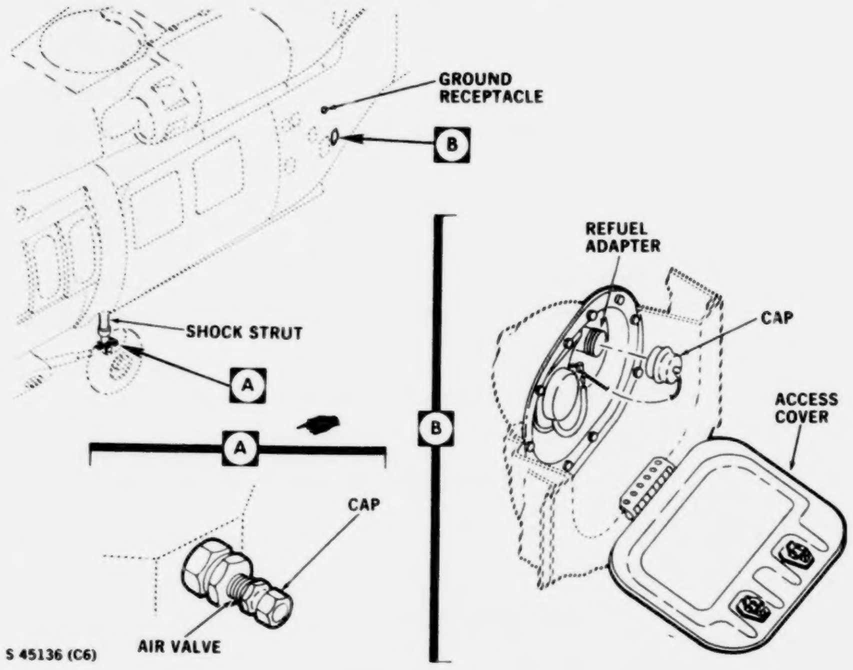

GROUND RECEPTACLE
B
SHOCK STRUT
A
REFUEL ADAPTER
CAP
ACCESS COVER
A
B
CAP
AIR VALVE
S 45136 (C6)

Figure 11-5

STEP 5 CLOSED CIRCUIT REFUEL (CONT)

- Open access cover.
- Remove cap from refuel adapter.
- Connect fuel nozzle to refuel adapter.
- Set refueling pump system to provide a line pressure of 15 psi.

REFUEL

- Start refueling system and fuel helicopter.
- Turn off refueling system when no flow is indicated.
- Remove fuel nozzle from refuel adapter.
- Install cap on refuel adapter.
- Close access cover.
- Unplug fuel nozzle ground from ground receptacle on helicopter fuselage.
- Disconnect ground cable between helicopter and servicing unit.
- Disconnect static ground cable from servicing unit.

TASK 12

FUEL SYSTEM PRIMING

- **PRIME SYSTEM - STEP 1**

MANPOWER

- Two Men Required: MOS 67T - Tactical Transport Helicopter Repairer
  Assistant

SUPPLIES

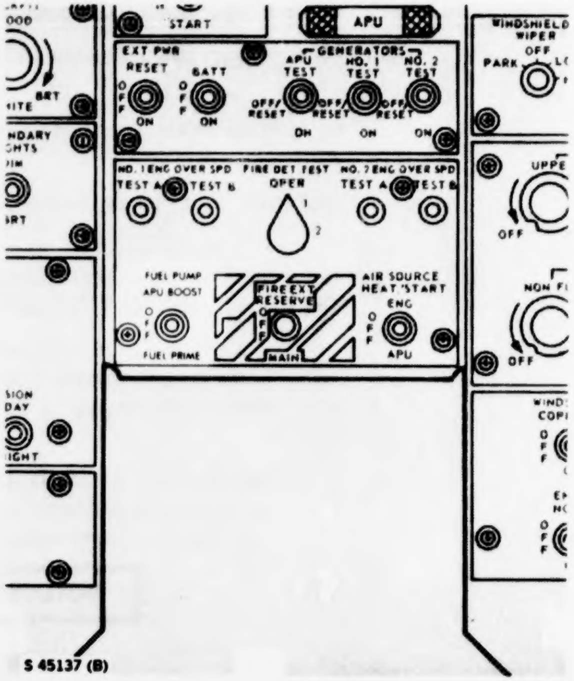
- None

TOOLS

- None

ALSO NEEDED

- Gallon Container to Catch Fuel (STEP 1)


START
APU
EXT PWR
RESET
BATT
GENERATORS
APU TEST
NO. 1 TEST
NO. 2 TEST
OFF/RESET
ON
WINDSHIELD WIPER
OFF
PARK
NO. 1 ENG OVER SPD
TEST A
TEST B
FIRE DET TEST
OPER
NO. 2 ENG OVER SPD
FUEL PUMP
APU BOOST
OFF
FUEL PRIME
FIRE EXT
RESERVE
MAIN
AIR SOURCE
HEAT START
ENG
APU
BRT
OFF

S 45137 (B)

STEP 1 PRIME SYSTEM

WARNING

To prevent damage to equipment or injury to personnel, observe normal fire precautions while doing this job. Use suitable container to catch fuel draining overboard.

PRIME

- Move and hold both ENG POWER CONT levers on control quadrant in cockpit in LOCKOUT.
- Place NO. 1 ENG FUEL SYS and NO. 2 ENG FUEL SYS selector levers on control quadrant in DIR detent.
- Place BATT switch on upper console in cockpit ON.
- Place suitable container beneath helicopter fuselage engine overboard drain at station 391/393.

CAUTION

Do not operate prime pump without fuel available at prime pickup line. Otherwise pump failure can occur by running the pump dry.

- While holding FUEL PUMP switch on upper console at FUEL PRIME, have assistant watch overboard drain until fuel flows into container.
- Place NO. 1 ENG FUEL SYS and NO. 2 ENG FUEL SYS selector levers on control quadrant in XFD detent.
- Have assistant watch overboard drain until fuel flows into container.
- Place FUEL PUMP switch on upper console in cockpit OFF.
- Place BATT switch on upper console OFF.
- Place NO. 1 ENG FUEL SYS and NO. 2 ENG FUEL SYS selector levers on control quadrant OFF.
- Place both ENG POWER CONT levers on control quadrant OFF.

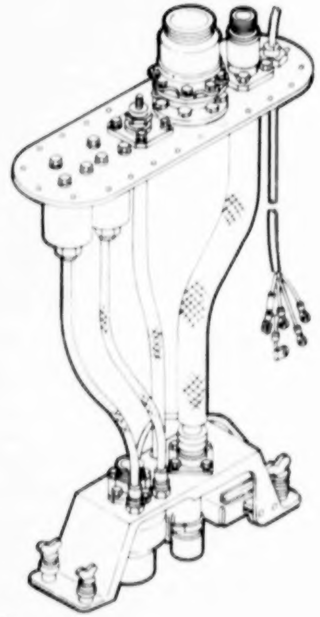
TASK 13

FUEL CELL COMPONENTS - REPLACE

- **REMOVE/INSTALL PLATE AND ATTACHED COMPONENTS -STEP 1**
- **REPLACE HI-LEVEL SHUTOFF VALVES - STEP 2**
- **REPLACE PRESSURE REFUEL/DEFUEL VALVE - STEP 3**
- **REPLACE SUMP DRAIN VALVE - STEP 4**
- **REPLACE PRIME/BOOST PUMP CHECK VALVE - STEP 5**
- **REPLACE MAIN FUEL LINE CHECK VALVE - STEP 6**
- **REPLACE LOW-LEVEL SHUTOFF VALVE - STEP 7**
- **REPLACE PRESSURE REFUELING INTERCONNECT TUBE - STEP 8**
- **REPLACE EXTENDED RANGE INTERCONNECT HOSE - STEP 8.1**
- **REPLACE FUEL BOOST PUMP - STEP 9**
- **REPLACE CHECK VALVE - STEP 10**
- **REPLACE FUEL PRESSURE SWITCH - STEP 11**

PERSONNEL REQUIRED

- Two People Required: MOS 67T - Tactical Transport Helicopter Repairer
  MOS 68G - Aircraft Structural Repairer



S 45138 (C3)

SUPPLIES

- Antiseize Compound, MIL-A-907, NSN 8030-00-597-5367 (STEPS 1, 2, 3, 4, 5, 6, 7, 8, 8.1, 9, 10)
- Dry-Cleaning Solvent, Fed. Spec P-D-680, Type II, NSN 6850-00-637-6135 (STEPS 9, 10)
- Insulation Tubing, SS7114ET03-0600, (FSCM 78286) (STEP 9)
- Lockwire, MS20995NC40, NSN 9525-00-990-7799 (STEPS 3, 9)
- Packing, MS29512-04 (2 Required, STEP 2)
  (3 Required, STEP 3)
  (1 Required, STEP 7)
  (1 Required, STEP 9)
  (1 Required, STEP 11)
- Packing, MS29512-12 (1 Required, STEP 6)
  (1 Required, STEP 9)
  (1 Required, STEP 10)
- Packing, MS29513-032 (1 Required, STEP 1)
  (1 Required, STEP 8)
- Packing, MS29513-215 (1 Required, STEP 1)
  (1 Required, STEP 8.1)
- Packing, MS29513-222 (4 Required, STEP 1)
  (4 Required, STEP 8)
  (1 Required, STEP 8.1)
- Packing, MS29513-224 (1 Required, STEP 4)
- Packing, MS29513-230 (2 Required, STEP 1)

SUPPLIES (CONT)

- Packing, MS29513-281 (2 Required, STEP 1)
  (1 Required, STEP 8)
  (1 Required, STEP 8.1)
  (1 Required, STEP 9)
  (1 Required, STEP 10)
- Petrolatum, Fed. Spec VV-P-236, NSN 9150-00-250-0426 (STEPS 1, 2, 3, 4, 6, 7, 8, 8.1, 9, 10, 11)
- Seal, MS27195-20-24 (2 Required, STEP 3)
- Seal, MS27195-24 (2 Required, STEP 3)
- Sealing Compound, MIL-S-8802 (STEPS 1, 9)
- Tiedown Strap, MS3367-2-9, NSN 5975-00-156-3253 (2 Required, STEP 1)
- Tiedown Strap, MS3367-7-9, NSN 5975-00-570-9598 (1 Required, STEP 9)

STEP 1 REMOVE/INSTALL PLATE AND ATTACHED COMPONENTS

NOTE

The following procedures apply to plates attached to both No. 1 and No. 2 fuel cells.

DEFUEL

- Defuel fuel cells (TASK 11).
- Drain fuel cell sump (TASK 11).
- Purge fuel cell of fumes (TM 55-1500-204-25/1).

REMOVE

- Turn off all electrical power.
- On UH-60A helicopters, do this:
  - Remove troop seats from rear cabin (TM 55-1520-237-23-5).
  - Remove soundproofing from left/right stowage compartment and center structure in cabin midsection.
  - Unhook cargo netting to get into compartment.
- On EH 60A helicopters, do this:
  - For access to No. 1 fuel cell, remove plenum and evaporator pallet (TM 55-1520-237-23-5).
  - For access to No. 2 fuel cell, remove condenser pallet and loosen supply ducting (TM 55-1520-237-23-5).
- Unlock fastener studs securing left/right panel enclosing fuel system components on top of fuel cells. Remove panel from compartment.
- Remove screws and front panel from structure.

WARNING

To prevent injury to personnel or damage to equipment, follow normal fire precautions while doing this job. Use suitable container to catch fuel when draining fuel lines.

STEP 1 REMOVE/INSTALL PLATE AND ATTACHED COMPONENTS (CONT)

- Unbolt and remove access cover. Remove packing from cover.
- Remove bonding jumper from vent tube and from main fuel hose.
- Remove bonding jumper from fuel hose.
- Disconnect vent tube from vent valve and vent tube Y. Remove packings from vent tube.

STEP 1 REMOVE/INSTALL PLATE AND ATTACHED COMPONENTS (CONT)

- Disconnect electrical plugs from prime fuel shutoff valve, and upper fuel enclosure panel.
- On helicopters with MWO 55-1520-237-50-25 installed, do this:
  - Disconnect electrical connector from pressure switch.
  - Disconnect fuel boost pump electrical connector.
- Remove straps holding wiring to main fuel hose.
- Disconnect fuel hose from prime fuel shutoff valve. Cap fuel shutoff valve and plug fuel hose.
- Disconnect main fuel hose from main fuel breakaway valve. Remove packing from main fuel breakaway valve. Cap valve and plug main fuel hose.
- On No. 1 fuel cell only, disconnect fuel hose from prime/boost pump fuel breakaway valve. Cap breakaway valve and plug fuel hose.

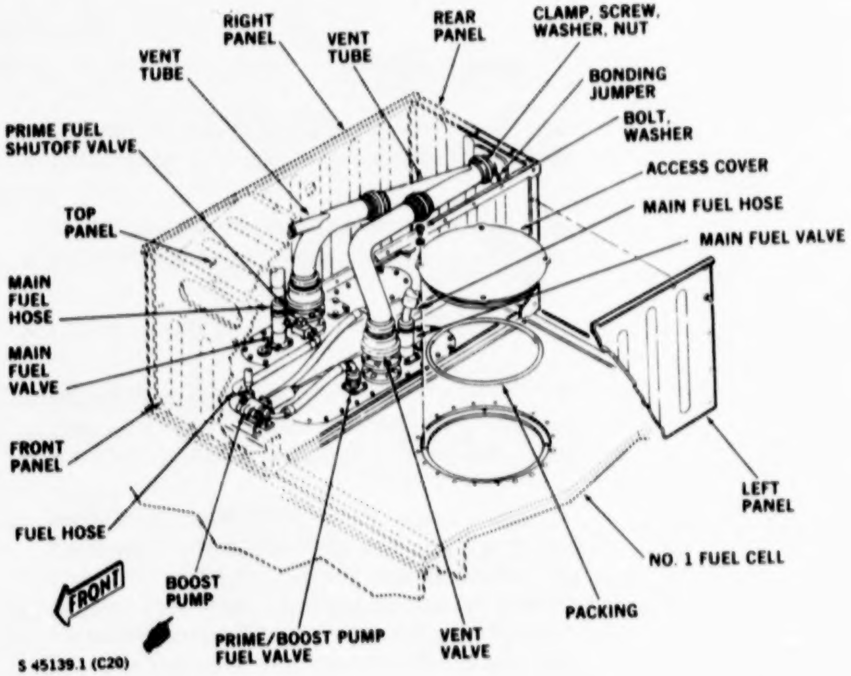
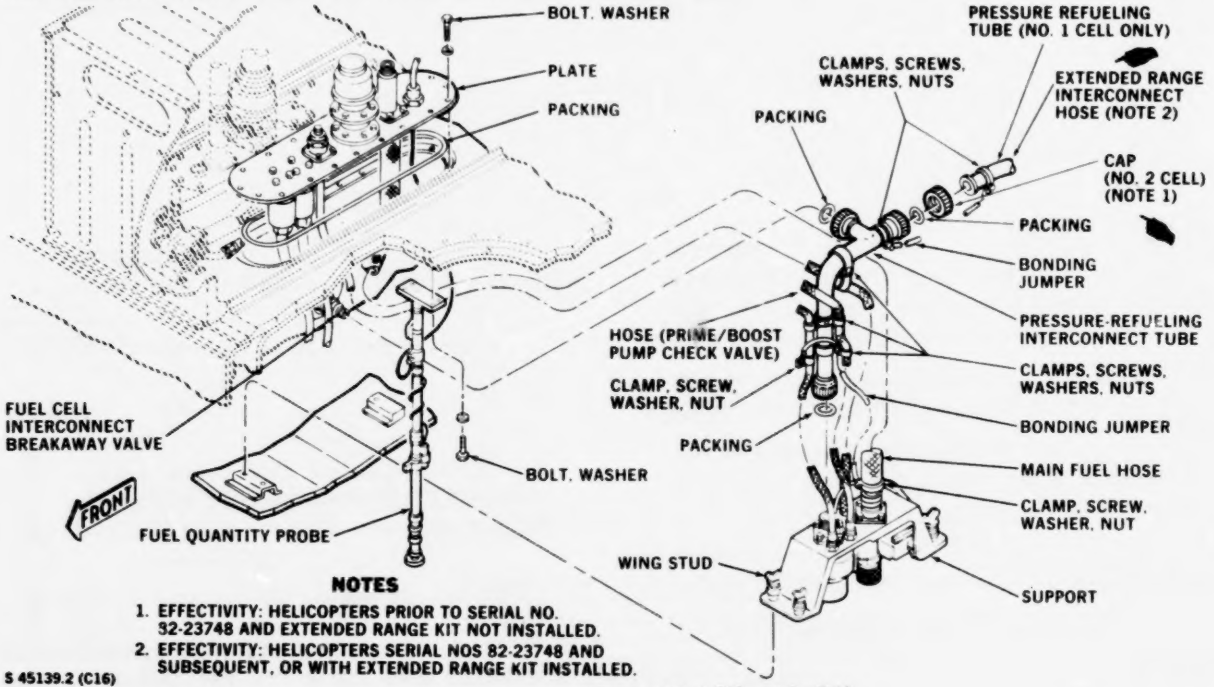

RIGHT PANEL
VENT TUBE
VENT TUBE
REAR PANEL
CLAMP, SCREW, WASHER, NUT
BONDING JUMPER
BOLT, WASHER
PRIME FUEL SHUTOFF VALVE
ACCESS COVER
MAIN FUEL HOSE
TOP PANEL
MAIN FUEL VALVE
MAIN FUEL HOSE
MAIN FUEL VALVE
FRONT PANEL
LEFT PANEL
FUEL HOSE
NO. 1 FUEL CELL
FRONT
BOOST PUMP
PACKING
PRIME/BOOST PUMP FUEL VALVE
VENT VALVE
S 45139.1 (C20)

Figure 13-1 (Sheet 1 of 4)

STEP 1 REMOVE/INSTALL PLATE AND ATTACHED COMPONENTS (CONT)

- Remove bolts holding plate to fuel cell.
- Remove screws and clamps holding tube to support in bottom of fuel cell.
- Unlock wing studs holding support to bottom of fuel cell.
- Remove screw and bonding jumpers from clamp on pressure refueling interconnect tube.
- Remove screw and bonding jumper from clamp on pressure refueling interconnect tube in No. 1 fuel cell.
- If removing plate from No. 1 fuel cell, disconnect pressure refueling interconnect tube from union on pressure refuel/defuel valve, fuel cell interconnect breakaway valve, and pressure refueling tube inside cell.
- If removing plate from No. 2 fuel cell, disconnect pressure refueling interconnect tube from union on pressure refuel/defuel valve and fuel cell interconnect breakaway valve inside cell. On helicopters serial Nos 82-23748 and subsequent, or with extended range kit installed, disconnect extended range interconnect hose.
- Remove pressure refueling interconnect tube from fuel cell. Remove packings from pressure refueling interconnect tube.
- Unbolt fuel quantity probe from top of fuel cell.
- On helicopters with MWO 55-1520-237-50-25 installed, remove fuel boost pump (STEP 9).
- Carefully remove plate with attached components and fuel quantity probe from fuel cell.

STEP 1 REMOVE/INSTALL PLATE AND ATTACHED COMPONENTS (CONT)


BOLT, WASHER
PLATE
PACKING
FUEL CELL INTERCONNECT BREAKAWAY VALVE
BOLT, WASHER
FRONT
FUEL QUANTITY PROBE
PRESSURE REFUELING TUBE (NO. 1 CELL ONLY)
CLAMPS, SCREWS, WASHERS, NUTS
EXTENDED RANGE INTERCONNECT HOSE (NOTE 2)
PACKING
CAP (NO. 2 CELL) (NOTE 1)
PACKING
BONDING JUMPER
PRESSURE-REFUELING INTERCONNECT TUBE
HOSE (PRIME/BOOST PUMP CHECK VALVE)
CLAMPS, SCREWS, WASHERS, NUTS
CLAMP, SCREW, WASHER, NUT
BONDING JUMPER
PACKING
MAIN FUEL HOSE
CLAMP, SCREW, WASHER, NUT
WING STUD
SUPPORT

NOTES

1. EFFECTIVITY: HELICOPTERS PRIOR TO SERIAL NO. 82-23748 AND EXTENDED RANGE KIT NOT INSTALLED.
2. EFFECTIVITY: HELICOPTERS SERIAL NOS 82-23748 AND SUBSEQUENT, OR WITH EXTENDED RANGE KIT INSTALLED.

S 45139.2 (C16)

Figure 13-1 (Sheet 2 of 4)

STEP 1 REMOVE/INSTALL PLATE AND ATTACHED COMPONENTS (CONT)

- Remove packing from fuel cell plate opening.
- Place temporary covering over plate and access cover openings to keep inside of fuel cell clean.

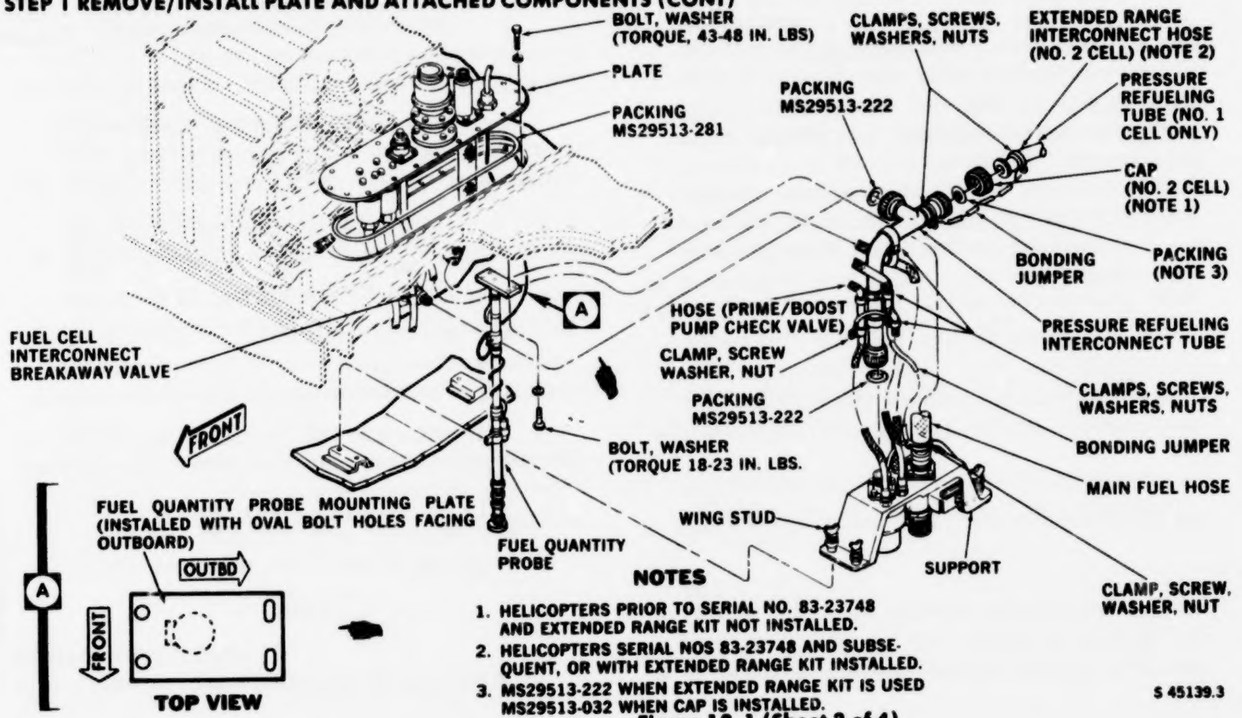
INSPECT

- Inspect vent tubes for dents and distortion.
- Replace tube if dents or distortion is over 10% of tube diameter.

INSTALL

- Turn off all electrical power.
- Remove temporary covering from plate and access cover openings.
- Lubricate packing, MS29513-281, with petrolatum, Fed. Spec VV-P-236. Install packing in groove in fuel cell plate opening.
- Install plate with attached components and fuel quantity transmitter into fuel cell.
- Coat threads of bolts with anti-seize compound, MIL-A-907. Bolt plate to fuel cell with washers and bolts. **TORQUE BOLTS TO 43 - 48 INCH-POUNDS**.

STEP 1 REMOVE/INSTALL PLATE AND ATTACHED COMPONENTS (CONT)


BOLT, WASHER
(TORQUE, 43-48 IN. LBS)
PLATE
PACKING
MS29513-281
CLAMPS, SCREWS,
WASHERS, NUTS
EXTENDED RANGE
INTERCONNECT HOSE
(NO. 2 CELL) (NOTE 2)
PACKING
MS29513-222
PRESSURE
REFUELING
TUBE (NO. 1
CELL ONLY)
CAP
(NO. 2 CELL)
(NOTE 1)
BONDING
JUMPER
PACKING
(NOTE 3)
A
HOSE (PRIME/BOOST
PUMP CHECK VALVE)
PRESSURE REFUELING
INTERCONNECT TUBE
FUEL CELL
INTERCONNECT
BREAKAWAY VALVE
CLAMP, SCREW
WASHER, NUT
PACKING
MS29513-222
CLAMPS, SCREWS,
WASHERS, NUTS
FRONT
BOLT, WASHER
(TORQUE 18-23 IN. LBS.
BONDING JUMPER
MAIN FUEL HOSE
FUEL QUANTITY PROBE MOUNTING PLATE
(INSTALLED WITH OVAL BOLT HOLES FACING
OUTBOARD)
WING STUD
FUEL QUANTITY
PROBE
SUPPORT
OUTBD
A
FRONT
CLAMP, SCREW,
WASHER, NUT
TOP VIEW
S 45139.3

NOTES

1. HELICOPTERS PRIOR TO SERIAL NO. 83-23748 AND EXTENDED RANGE KIT NOT INSTALLED.
2. HELICOPTERS SERIAL NOS 83-23748 AND SUBSEQUENT, OR WITH EXTENDED RANGE KIT INSTALLED.
3. MS29513-222 WHEN EXTENDED RANGE KIT IS USED MS29513-032 WHEN CAP IS INSTALLED.

Figure 13-1 (Sheet 3 of 4)

STEP 1 REMOVE/INSTALL PLATE AND ATTACHED COMPONENTS (CONT)

NOTE

Make sure oval bolt holes on mounting plate face outboard when installing fuel quantity probe (Figure 13-1, Detail A).

- Bolt fuel quantity probe to top of fuel cell. **TORQUE BOLTS TO 18 - 23 INCH POUNDS.**
- Lock wing studs fastening support to bottom of fuel cell.
- On helicopters with MWO 55-1520-237-50-25 installed, install fuel boost pump (STEP 9).
- Fasten clamps on tube to support in bottom of fuel cell with screws, washers, and nuts.
- Lubricate packings, MS29513-222, with petrolatum, Fed. Spec VV-P-236. Install packings on pressure refueling interconnect tube.
- Coat threads of union on pressure refuel/defuel valve and fuel cell interconnect breakaway valve with antiseize compound, MIL-A-907.
- If installing pressure refueling interconnect tube into No. 1 fuel cell, coat threads on pressure refueling tube with antiseize compound, MIL-A-907.
- Place pressure refueling interconnect tube in fuel cell.
- If installing tube in No. 1 fuel cell, connect pressure refueling interconnect tube to union on pressure refuel/defuel valve, fuel cell interconnect breakaway valve, and pressure refueling tube.
- If installing tube in No. 2 fuel cell, connect pressure refueling interconnect tube to union on pressure refuel/defuel valve and fuel cell interconnect breakaway valve. On helicopters serial Nos 82-23748 and subsequent, or with extended range kit installed, lubricate packing MS29513-222 with petrolatum, Fed. Spec VV-P-236. Install packing and extended range interconnect hose on pressure refuel interconnect tube. **TIGHTEN NUT HANDTIGHT.**

STEP 1 REMOVE/INSTALL PLATE AND ATTACHED COMPONENTS (CONT)

NOTE

If installing new pressure refuel interconnect tube in helicopters prior to serial No. 82-23748, or without extended range kit installed, install packing, MS29513-032, lubricated with petrolatum, Fed. Spec VV-P-236 and cap on tube. **TIGHTEN CAP HANDTIGHT.**

- Connect bonding jumper on main fuel hose and high-level shutoff hose to clamp on pressure refueling interconnect tube with screw, washers, and nut.
- On No. 1 fuel cell only, connect bonding jumper on pressure refueling interconnect tube to clamp on pressure refueling tube with screw, washers, and nut.
- Uncap and coat threads on prime/boost pump fuel breakaway valve with antiseize compound, MIL-A-907 (No. 1 fuel cell only).
- Unplug and connect fuel hose to prime/boost pump fuel breakaway valve (No. 1 fuel cell only).
- Lubricate packing, MS29513-215, with petrolatum, Fed. Spec VV-P-236. Uncap main fuel breakaway valve. Install packing on valve.
- Coat threads on main fuel breakaway valve with antiseize compound, MIL-A-907.
- Unplug and connect main fuel hose to main fuel breakaway valve.
- Uncap prime fuel shutoff valve. Coat threads on prime fuel shutoff valve with antiseize compound, MIL-A-907.

STEP 1 REMOVE/INSTALL PLATE AND ATTACHED COMPONENTS (CONT)

- Unplug and connect fuel hose to prime fuel shutoff valve.
- Connect electrical plugs to prime fuel shutoff valve, and upper fuel enclosure panel.
- If electrical connector was disconnected, connect it to pressure switch.
- If fuel boost pump electrical connector was disconnected, connect it.
- Secure fuel quantity probe wiring to main fuel hose with straps, MS3367-2-9.
- Lubricate packings, MS29513-230, with petrolatum, Fed. Spec VV-P-236. Install packings on ends of vent tube.
- Connect vent tube to vent valve and vent tube Y.
- Connect bonding jumper from vent tube and from main fuel hose.

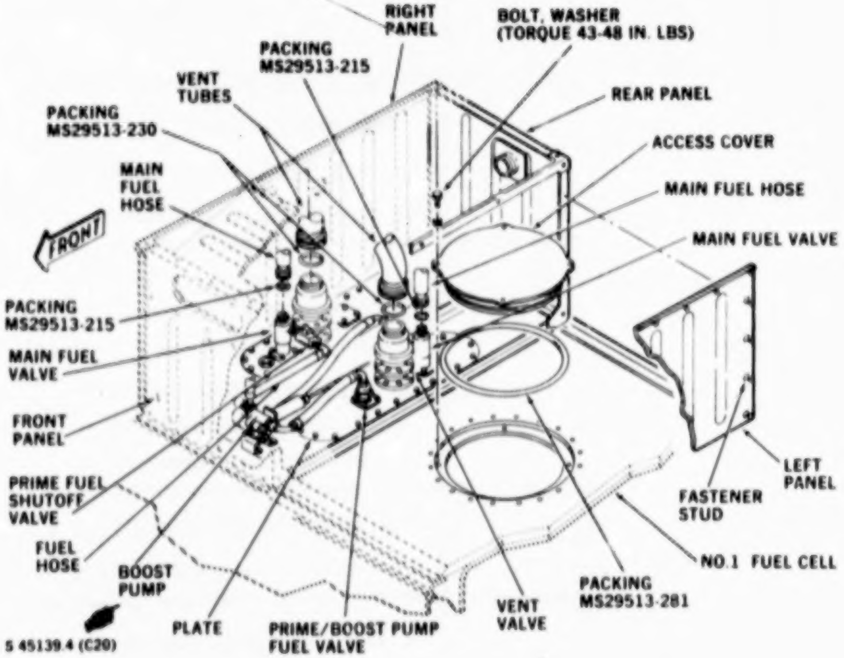

RIGHT PANEL
BOLT, WASHER (TORQUE 43-48 IN. LBS)
PACKING MS29513-215
VENT TUBES
REAR PANEL
PACKING MS29513-230
ACCESS COVER
MAIN FUEL HOSE
MAIN FUEL HOSE
MAIN FUEL VALVE
FRONT
PACKING MS29513-215
MAIN FUEL VALVE
FRONT PANEL
PRIME FUEL SHUTOFF VALVE
LEFT PANEL
FASTENER STUD
FUEL HOSE
BOOST PUMP
NO.1 FUEL CELL
PACKING MS29513-281
VENT VALVE
PLATE
PRIME/BOOST PUMP FUEL VALVE
5 45139.4 (C20)

Figure 13-1 (Sheet 4 of 4)

STEP 1 REMOVE/INSTALL PLATE AND ATTACHED COMPONENTS (CONT)

- Check nutplates on fuel cell access cover. If nutplates are stripped or loose, do this:
  - Remove nutplate (TM 55-1500-204-25/1).
  - Apply a light coat of sealing compound, MIL-S-8802, to mounting face of nutplate.
  - Install nutplate per TM 55-1500-204-25/1.
  - Wipe off extra sealing compound with a clean cloth.
- Lubricate packing, MS29513-281, with petrolatum, Fed. Spec VV-P-236. Install packing on fuel cell access cover.
- Inspect work area to make certain it is clean and free of all tools.
- Coat threads of bolts with antiseize compound, MIL-A-907. Bolt access cover to fuel cell. **TORQUE BOLTS TO 43 - 48 INCH-POUNDS.**
- Pressure test fuel system (TASK 18).
- Install front panel with screws.
- Install left/right panel, enclosing fuel system components. Lock fastener studs.
- On UH-60A helicopters, do this:
  - Hook cargo netting in aft section stowage compartment access opening.
  - Install soundproofing.
  - Install troop seats (TM 55-1520-237-23-5).
- On EH-60A helicopters, do this:
  - Install evaporator pallet and plenum (TM 55-1520-237-23-5).
  - Install condenser pallet and tighten supply ducting (TM 55-1520-237-23-5).
- Refuel fuel cells (TASK 11).
- Prime fuel system (TASK 12).
- Do an operational check (TM 55-1520-237-23-3).

STEP 2 REPLACE HI-LEVEL SHUTOFF VALVES

NOTE

- Each fuel cell contains two hi-level shutoff valves. If the hi-level shutoff system has malfunctioned, both valves in the malfunctioning cell should be replaced.
- The following procedures apply to both hi-level shutoff valves in both No. 1 and No. 2 fuel cells.

REMOVE

- Defuel helicopter (TASK 11).
- Remove plate and attached components from fuel cell (STEP 1).
- Disconnect hose from union. Plug hose.
- Unthread union from hi-level shutoff valve. Remove packing from union.
- Unbolt and remove hi-level shutoff valve and spacers from plate.

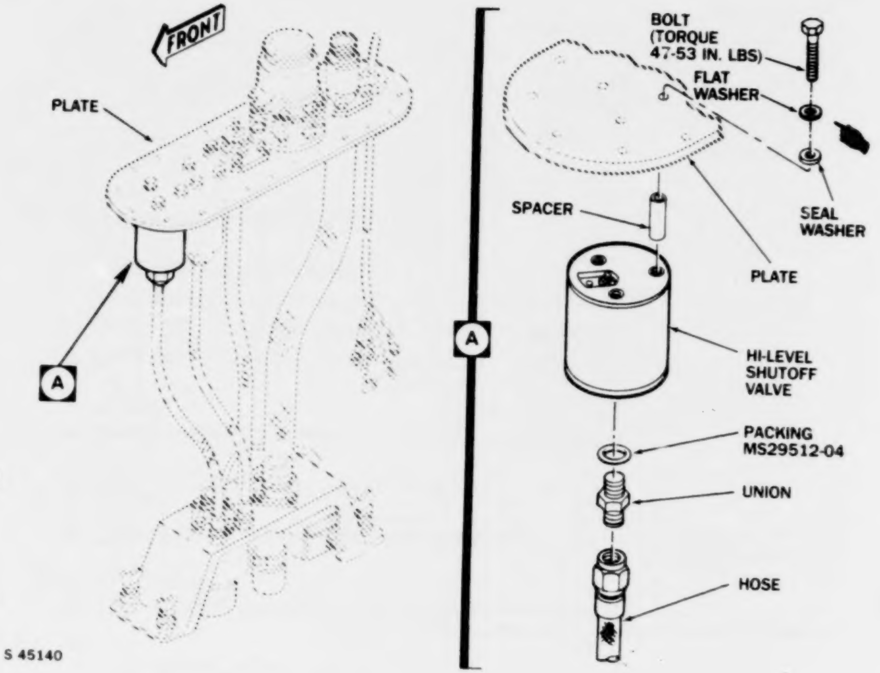

FRONT
PLATE
A
S 45140
BOLT (TORQUE 47-53 IN. LBS)
FLAT WASHER
SPACER
SEAL WASHER
PLATE
A
HI-LEVEL SHUTOFF VALVE
PACKING MS29512-04
UNION
HOSE

Figure 13-2

STEP 2 REPLACE HI-LEVEL SHUTOFF VALVES (CONT)

INSTALL

- Coat threads of bolts with antiseize compound, MIL-A-907. Install bolts, flat washers, and seal washers.

NOTE

Make sure that the flat washers are installed next to boltheads (Figure 13-2, Detail A).

- Place spacers beneath plate at each attachment hole and bolt hi-level shutoff valve to plate assembly. **TORQUE BOLTS TO 47 - 53 INCH-POUNDS.**
- Lubricate packing, MS29512-04, with petrolatum, Fed. Spec VV-P-236.
- Install packing on union end that threads into hi-level shutoff valve.
- Coat threads on union with antiseize compound, MIL-A-907.
- Thread union into hi-level shutoff valve.
- Unplug and connect hose to union.
- Install plate and attached components in fuel cell (STEP 1).
- Pressure refuel fuel cells (TASK 11). Check hi-level shutoff valves for proper operation by noting that shutoff occurs before fuel is dumped from vent beneath helicopter.
- Prime fuel system (TASK 12).

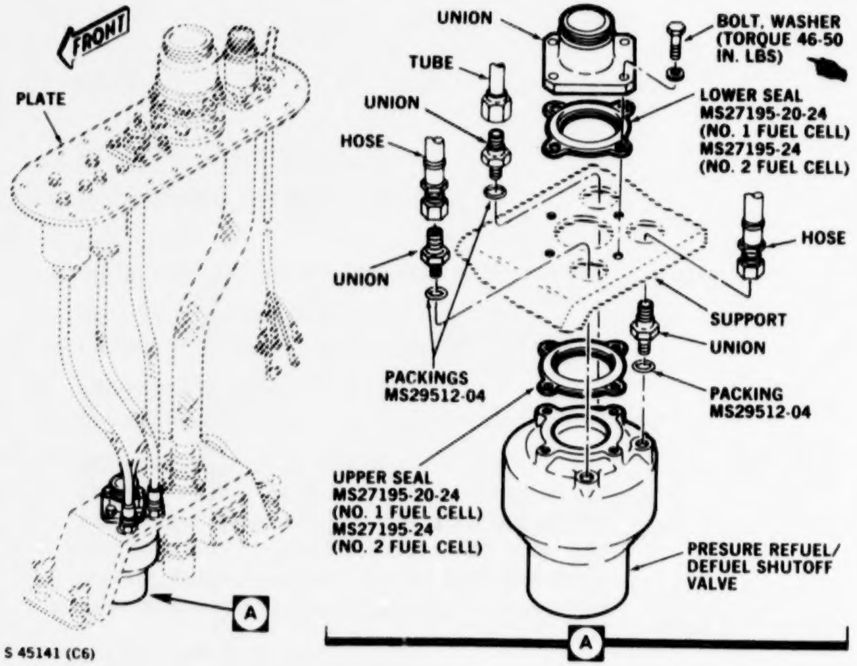
STEP 3 REPLACE PRESSURE REFUEL/DEFUEL VALVE

NOTE

> The following procedures apply to both No. 1 and No. 2 fuel cell pressure refuel/defuel valves.

REMOVE

- Defuel helicopter (TASK 11). Remove plate and attached components from fuel cell (STEP 1).
- Disconnect hoses from unions on pressure refuel/defuel valve. Plug hoses.
- Disconnect tube from union on pressure refuel/defuel valve. Plug tube.
- Unbolt union from upper and lower seals, and pressure refuel/defuel valve from support.
- Remove unions from pressure refuel/defuel valve. Remove packings from unions.


FRONT
PLATE
A
UNION
TUBE
UNION
HOSE
UNION
BOLT, WASHER (TORQUE 46-50 IN. LBS)
LOWER SEAL MS27195-20-24 (NO. 1 FUEL CELL) MS27195-24 (NO. 2 FUEL CELL)
HOSE
SUPPORT
UNION
PACKINGS MS29512-04
PACKING MS29512-04
UPPER SEAL MS27195-20-24 (NO. 1 FUEL CELL) MS27195-24 (NO. 2 FUEL CELL)
PRESURE REFUEL/ DEFUEL SHUTOFF VALVE
A

S 45141 (C6)

Figure 13-3

STEP 3 REPLACE PRESSURE REFUEL/DEFUEL VALVE (CONT)

INSTALL

- Lubricate packings, MS29512-04, with petrolatum, Fed. Spec VV-P-236.
- Install packings on unions.
- Coat threads on unions with anti-seize compound, MIL-A-907.
- Install unions in ports on pressure refuel/defuel valve.
- Coat threads on bolts with anti-seize compound, MIL-A-907.

NOTE

If replacing No. 1 fuel cell pressure refuel/defuel valve, use seals, MS27195-20-24, on installation. If No. 2 fuel cell pressure refuel/defuel valve is being replaced, use seals, MS27195-24.

- Place lower seal on top of pressure refuel/defuel valve. Position valve beneath support. Place upper seal on support. Place union on upper seal. Bolt union and valve to support. **TORQUE BOLTS TO 46 - 50 INCH-POUNDS**. Lockwire, MS20995NC40, bolts together.
- Unplug and connect tube to union on pressure refuel/defuel valve.
- Unplug and connect hoses to unions on pressure refuel/defuel shutoff valve.
- Install plate and attached components in fuel cell (STEP 1).
- Pressure refuel fuel cell (TASK 11).
- Prime fuel system (TASK 12).

STEP 4 REPLACE SUMP DRAIN VALVE

NOTE

The following procedures apply to both No. 1 and No. 2 fuel cell sump drain valves.

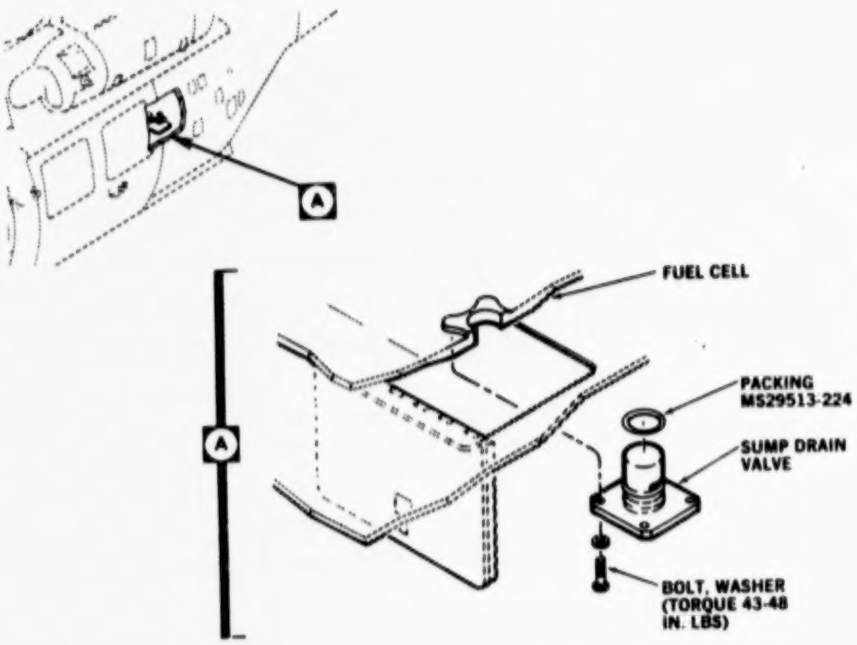
INSPECT

- Open access cover beneath helicopter.
- Check self-sealing area on top of door, and around sump, for fuel.
- If fuel is found in this area, indicating seepage, do this:
  - Wipe area dry with clean cloth.
  - Close access cover.
  - Recheck self-sealing area after 24 hours.

NOTE

Helicopter may be operated during this 24-hour period.

- If after 24 hours, fuel is found in self-sealing area, operate drain valve six times using probe 70307-03018-102 (TASK 11).


A
FUEL CELL
PACKING MS29513-224
SUMP DRAIN VALVE
A
BOLT, WASHER (TORQUE 43-48 IN. LBS)

S 45142 (C6)

Figure 13-4

STEP 4 REPLACE SUMP DRAIN VALVE (CONT)

- Wipe area dry. Close cover.
- Recheck self-sealing area after 24 hours. **REPLACE SUMP DRAIN VALVE IF FUEL DRIPS FROM COVER.**

DEFUEL

- Defuel fuel cells (TASK 11).
- Drain fuel cell sump (TASK 11).
- Purge fuel cell of fumes (TM 55-1500-204-25/1).

REMOVE

- Open access cover beneath helicopter.
- Unbolt sump drain valve from fuel cell.
- Remove packing from sump drain valve.

INSTALL

- Lubricate packing, MS29513-224, with petrolatum, Fed. Spec VV-P-236.
- Install packing in groove on sump drain valve.
- Coat threads on bolts with antiseize compound, MIL-A-907.
- Install sump drain valve in fuel cell. Bolt sump drain valve to fuel cell. **TORQUE BOLTS TO 43 - 48 INCH-POUNDS.**
- Pressure-test fuel cell (TASK 18).
- Refuel fuel cells (TASK 11).
- Check for leaks. **NO LEAKAGE ALLOWED.**
- Check area to be sure it is free of foreign objects, then close access cover beneath helicopter.
- Prime fuel system (TASK 12).

STEP 5 REPLACE PRIME/BOOST PUMP CHECK VALVE

NOTE

The following procedures apply to the prime/boost pump check valve installed in No. 1 fuel cell only.

REMOVE

- Defuel helicopter (TASK 11). Remove plate and attached components from fuel cell (STEP 1).
- Disconnect hose from prime/boost pump check valve. Plug hose.
- Disconnect clamp on prime/boost pump check valve from clamp on main fuel line check valve. Remove clamp and spacer from prime/boost pump check valve.

INSTALL

- Install clamp on prime/boost pump check valve.
- Place clamp on prime/boost pump check valve. Connect clamp and spacer to clamp on main fuel line check valve with screw, washers, and nut.

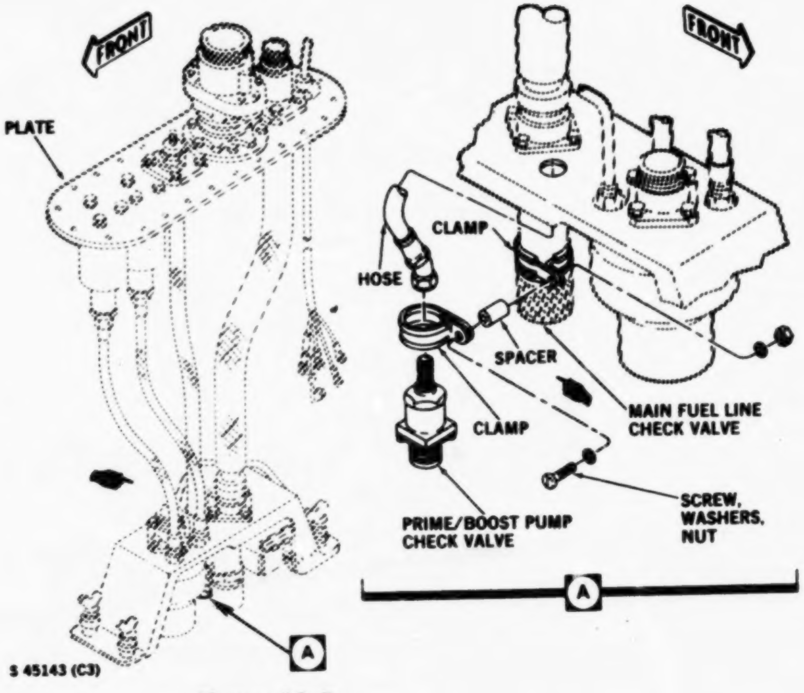

FRONT
PLATE
A
S 45143 (C3)
FRONT
CLAMP
HOSE
SPACER
CLAMP
MAIN FUEL LINE CHECK VALVE
SCREW, WASHERS, NUT
PRIME/BOOST PUMP CHECK VALVE
A

Figure 13-5

STEP 5 REPLACE PRIME/BOOST PUMP CHECK VALVE (CONT)

- Coat threads on prime/boost pump check valve with antiseize compound, MIL-A-907.
- Unplug and connect hose to prime/boost check valve.
- Install plate and attached components in fuel cell (STEP 1).
- Refuel fuel cells (TASK 11).
- Prime fuel system (TASK 12).

STEP 6 REPLACE MAIN FUEL LINE CHECK VALVE

NOTE

The following procedures apply to both No. 1 and No. 2 fuel cell main fuel line check valves.

REMOVE

- Defuel helicopter (TASK 11). Remove plate and attached components from fuel cell (STEP 1).
- Disconnect clamp on prime/boost pump check valve from clamp on main fuel line check valve (No. 1 fuel cell only).
- Unthread check valve from adapter.
- Remove packing and clamp from main fuel line check valve.

INSTALL

- Install clamp on main fuel line check valve.
- Lubricate MS29512-12 packing with petrolatum, Fed. Spec VV-P-236. Install packing on main fuel line check valve.

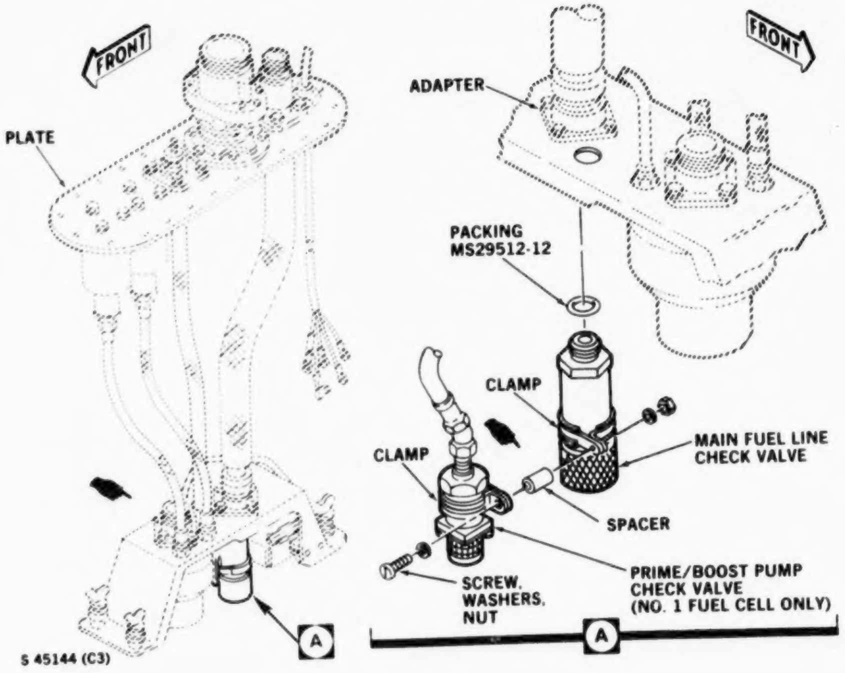

FRONT
PLATE
A
S 45144 (C3)
ADAPTER
FRONT
PACKING MS29512-12
CLAMP
MAIN FUEL LINE CHECK VALVE
CLAMP
SPACER
SCREW, WASHERS, NUT
PRIME/BOOST PUMP CHECK VALVE (NO. 1 FUEL CELL ONLY)
A

Figure 13-6

STEP 6 REPLACE MAIN FUEL LINE CHECK VALVE (CONT)

- Coat threads on main fuel line check valve with antiseize compound, MIL-A-907.
- Thread main fuel line check valve into adapter.
- Position and connect clamp on prime/boost pump check valve to clamp on main fuel line check valve (No. 1 fuel cell only).
- Install plate and attached components in fuel cell (STEP 1).
- Refuel fuel cells (TASK 11).
- Prime fuel system (TASK 12).
- Operational check system for reason for component replacement (TM 55-1520-237-23-3).

STEP 7 REPLACE LOW-LEVEL SHUTOFF VALVE

NOTE

The following procedures apply to low-level shutoff valves in both No. 1 and No. 2 fuel cells.

REMOVE

- Defuel helicopter (TASK 11). Remove plate and attached components from fuel cell (STEP 1).
- Disconnect tube from union on low-level shutoff valve. Plug tube.
- Unbolt and remove low-level shutoff valve from support.
- Remove union and packing from low-level shutoff valve.

INSTALL

- Lubricate packing, MS29512-04, with petrolatum, Fed. Spec VV-P-236.
- Install packing on union.

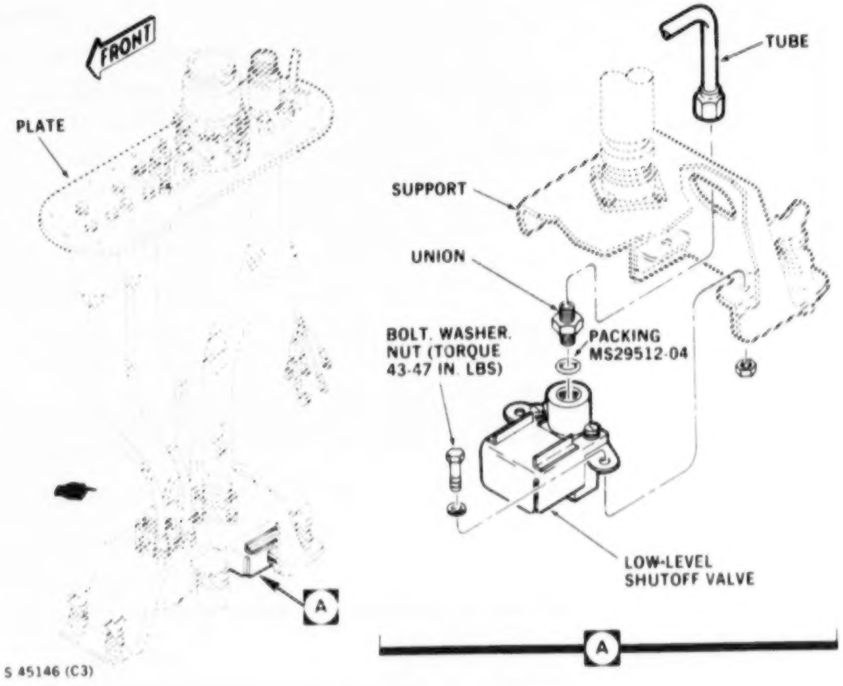

FRONT
PLATE
A
S 45146 (C3)
TUBE
SUPPORT
UNION
BOLT, WASHER, NUT (TORQUE 43-47 IN. LBS)
PACKING MS29512-04
LOW-LEVEL SHUTOFF VALVE
A

Figure 13-7

STEP 7 REPLACE LOW-LEVEL SHUTOFF VALVE (CONT)

- Coat threads on union with antiseize compound, MIL-A-907.
- Thread union into low-level shutoff valve.
- Coat threads on bolts with antiseize compound, MIL-A-907.
- Bolt low-level shutoff valve to support. **TORQUE NUTS TO 43 - 47 INCH-POUNDS.**
- Unplug and connect tube to union on low-level shutoff valve.
- Install plate and attached components in fuel cell (STEP 1).
- Refuel fuel cells (TASK 11).
- Prime fuel system (TASK 12).
- Operational check system for reason for component replacement (TM 55-1520-237-23-3).

STEP 8 REPLACE PRESSURE REFUELING INTERCONNECT TUBE

NOTE

The following procedures apply to the pressure refueling interconnect tubes in both No. 1 and No. 2 fuel cells.

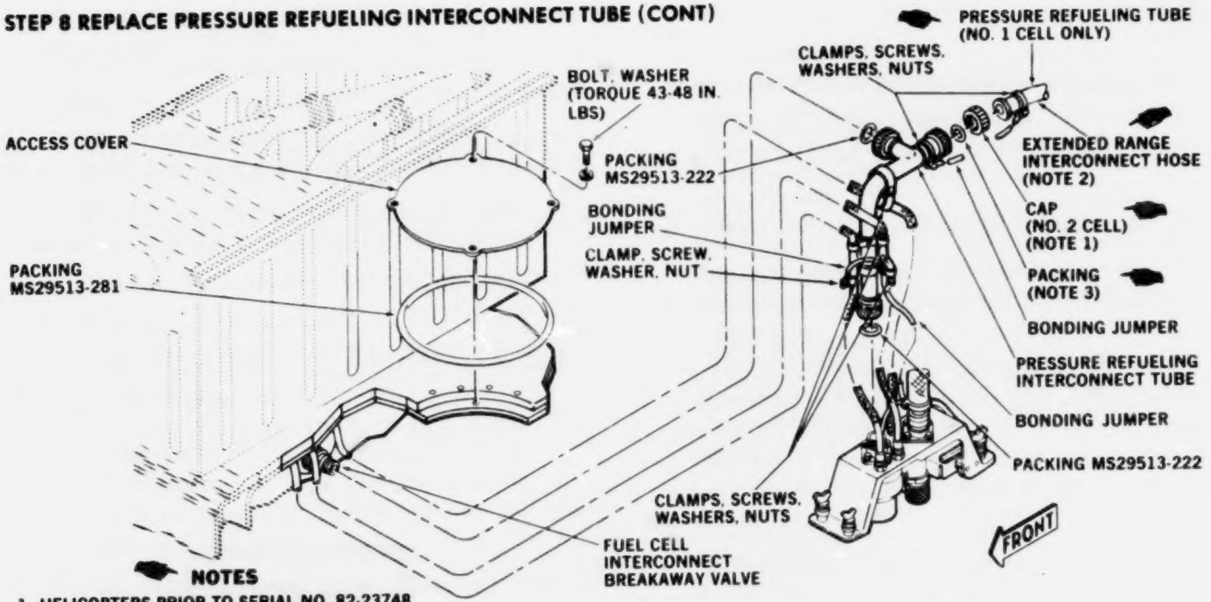
DEFUEL

- Defuel fuel cells (TASK 11).
- Drain fuel cell sump (TASK 11).

REMOVE

- On UH-60A helicopters, do this:
  - Remove troop seats from rear cabin (TM 55-1520-237-23-5).
  - Remove soundproofing blanket from left/right stowage compartment in cabin midsection.
  - Unhook cargo netting to get into compartment.
- On EH-60A helicopters do this:
  - For access to No. 1 fuel cell remove plenum and evaporator pallet (TM 55-1520-237-23-5).
  - For access to No. 2 fuel cell, remove condenser pallet and loosen supply ducting (TM 55-1520-237-23-5).

STEP 8 REPLACE PRESSURE REFUELING INTERCONNECT TUBE (CONT)


PRESSURE REFUELING TUBE (NO. 1 CELL ONLY)
CLAMPS, SCREWS, WASHERS, NUTS
BOLT, WASHER (TORQUE 43-48 IN. LBS)
ACCESS COVER
PACKING MS29513-222
EXTENDED RANGE INTERCONNECT HOSE (NOTE 2)
BONDING JUMPER
CAP (NO. 2 CELL) (NOTE 1)
CLAMP, SCREW, WASHER, NUT
PACKING MS29513-281
PACKING (NOTE 3)
BONDING JUMPER
PRESSURE REFUELING INTERCONNECT TUBE
BONDING JUMPER
PACKING MS29513-222
CLAMPS, SCREWS, WASHERS, NUTS
FRONT
FUEL CELL INTERCONNECT BREAKAWAY VALVE
S 47147 (C16)

NOTES

1. HELICOPTERS PRIOR TO SERIAL NO. 82-23748 AND EXTENDED RANGE KIT NOT INSTALLED.
2. HELICOPTERS SERIAL NOS 82-23748 AND SUBSEQUENT, OR WITH EXTENDED RANGE KIT INSTALLED.
3. MS29513-222 WHEN EXTENDED RANGE KIT IS INSTALLED MS29513-032 WHEN EXTENDED RANGE KIT IS NOT INSTALLED.

Figure 13-8

STEP 8 REPLACE PRESSURE REFUELING INTERCONNECT TUBE (CONT)

WARNING

To prevent damage to equipment or injury to personnel, observe normal fire precautions while doing this job. Use suitable container to catch fuel when draining fuel lines.

- Unbolt and remove fuel cell access cover. Remove packing from cover.
- Purge fuel cell of fumes (TM 55-1500-204-25/1).
- Remove screw and bonding jumper from clamp on pressure refueling tube in No. 1 fuel cell.
- Remove screw and bonding jumpers from clamp on pressure refueling interconnect tube.
- Remove screw from clamps holding hose assemblies to pressure refueling interconnect tube.
- Inside No. 1 fuel cell, disconnect pressure refueling interconnect tube from union on pressure refuel/defuel valve, fuel cell interconnect breakaway valve, and pressure refueling tube. Cap valve and plug tube.
- Inside No. 2 fuel cell, disconnect pressure refueling interconnect tube from union on pressure refuel/defuel valve and fuel cell interconnect breakaway valve. Plug tube and cap valve. On helicopters serial Nos 82-23748 and subsequent, or with extended range kit installed, disconnect extended range interconnect hose.
- Remove clamps from pressure refueling interconnect tube and keep for installation.
- Remove pressure refueling interconnect tube from fuel cell.
- Place temporary cover over access cover opening to keep inside of fuel cell clean.
- Remove packings from pressure refueling interconnect tube.

STEP 8 REPLACE PRESSURE REFUELING INTERCONNECT TUBE (CONT)

INSPECT

- Inspect pressure refueling interconnect tubes for dents and distortion.
- Replace tubes if dents or local distortion is greater than 20% of tube diameter.

INSTALL

- Lubricate packings, MS29513-222, with petrolatum, Fed. Spec VV-P-236.
- Install packings on pressure refueling interconnect tube.
- Remove temporary cover from access cover opening.
- Coat threads on adapter and breakaway valve with antiseize compound, MIL-A-907.
- If installing pressure refueling interconnect tube in No. 1 fuel cell, coat threads on pressure refueling tube with antiseize compound, MIL-A-907.
- Place pressure refueling interconnect tube in fuel cell.
- Inside No. 1 fuel cell, connect pressure refueling interconnect tube to union on pressure refuel/defuel valve, fuel cell interconnect breakaway valve, and pressure refueling tube.
- Inside No. 2 fuel cell, connect pressure refueling interconnect tube to union on pressure refuel/defuel valve and fuel cell interconnect breakaway valve. On helicopters serial Nos 82-23748 and subsequent, or with extended range kit installed, lubricate packing, MS29513-222 with petrolatum, Fed. Spec VV-P-236. Install packing and extended range interconnect hose on pressure refuel interconnect tube.

NOTE

If installing new pressure refuel interconnect tube in helicopters prior to serial No. 82-23748, or without extended range kit installed, install packing, MS29513-032, lubricated with petrolatum, Fed. Spec VV-P-236 on cap and tube. **TIGHTEN CAP HANDTIGHT.**

STEP 8 REPLACE PRESSURE REFUELING INTERCONNECT TUBE (CONT)

- Place clamps loosely on pressure refueling interconnect tube.
- In No. 1 fuel cell, connect bonding jumper on pressure refueling interconnect tube to clamp on pressure refueling tube with screw, washer, and nut.
- Connect bonding jumper on main fuel hose and hi-level shutoff hose to clamp on pressure refueling interconnect tube with screw, washers, and nut.
- Connect clamps that hold hose assemblies to pressure refueling interconnect tube with screws, washers, and nuts.
- Lubricate packing, MS29513-281, with petrolatum, Fed. Spec VV-P-236.
- Install packing on fuel cell access cover.
- Coat threads of bolts with antiseize compound, MIL-A-907.
- Inspect area inside of fuel cell to be sure it is free of all foreign objects.
- Bolt access cover to fuel cell. **TORQUE BOLTS TO 43 - 48 INCH-POUNDS.**
- Inspect area to be sure it is free of all foreign objects.
- On UH-60A helicopters, do this:
  - Hook cargo netting in aft section stowage compartment access opening.
  - Install soundproofing blanket.
  - Install troop seats (TM 55-1520-237-23-5).
- On EH-60A helicopters, do this:
  - Install evaporator pallet and plenum (TM 55-1520-237-23-5).
  - Install condenser pallet and tighten supply ducting (TM 55-1520-237-23-5).
- Refuel fuel cells (TASK 11).
- Prime fuel system (TASK 12).

STEP 8.1 REPLACE EXTENDED RANGE INTERCONNECT HOSE

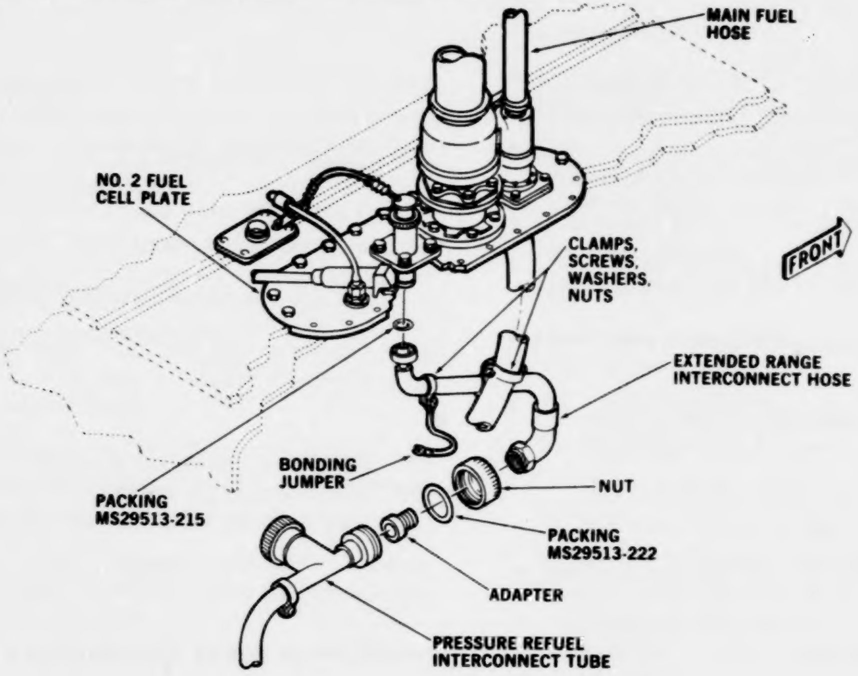
NOTE

The following procedures apply to helicopters serial Nos 82-23748 and subsequent, or with extended range kit installed.

REMOVE

- Turn off all electrical power.
- Defuel helicopter (TASK 11).
- On UH-60A helicopters, do this:
  - Remove troop seats from rear cabin (TM 55-1520-237-23-5).
  - Remove soundproofing from left/right stowage compartment and center structure in cabin midsection.
  - Unhook cargo netting to get into compartment.
- On EH-60A helicopters, do this:
  - For access to No. 1 fuel cell, remove plenum and evaporator pallet (TM 55-1520-237-23-5).
  - For access to No. 2 fuel cell, remove condenser pallet and loosen supply ducting (TM 55-1520-237-23-5).
- Purge fuel cell of fumes (TM 55-1500-204-25/1).
- Remove bolts and fuel cell access cover. Remove and discard packing.
- Remove screw, washer, nut, and free bonding jumper from extended range interconnect hose.
- Disconnect clamps securing interconnect hose to main fuel hose.

STEP 8.1 REPLACE EXTENDED RANGE INTERCONNECT HOSE (CONT)


MAIN FUEL HOSE
NO. 2 FUEL CELL PLATE
CLAMPS, SCREWS, WASHERS, NUTS
FRONT
EXTENDED RANGE INTERCONNECT HOSE
BONDING JUMPER
NUT
PACKING MS29513-215
PACKING MS29513-222
ADAPTER
PRESSURE REFUEL INTERCONNECT TUBE

S 73054 (C16)

Figure 13-8.1

STEP 8.1 REPLACE EXTENDED RANGE INTERCONNECT HOSE (CONT)

- Disconnect upper end of hose from extended range breakaway valve.
- Disconnect lower end of hose from pressure refueling interconnect tube.
- Remove hose from helicopter. Remove and discard packings on pressure refueling interconnect tube and extended range breakaway valve.
- Install packing, MS29513-222, lubricated with petrolatum, Fed. Spec VV-P-236, on pressure refuel interconnect tube.
- Install packing, MS29513-215, lubricated with petrolatum, Fed. Spec VV-P-236, on extended range breakaway valve.
- Install extended range interconnect hose between extended range breakaway valve and pressure refuel interconnect valve.
- Secure hose to main fuel hose with clamps, screws, washers, and nuts.
- Install bonding jumper on extended range interconnect hose with clamp, screw, washer, and nut.
- Lubricate packing, MS29513-281, with petrolatum, Fed. Spec VV-P-236.
- Install packing on fuel cell access cover.
- Coat threads of bolts with antiseize compound, MIL-A-907.
- Inspect area inside of fuel cell to be sure it is free of all foreign objects.
- Bolt access cover to fuel cell. **TORQUE BOLTS TO 43 - 48 INCH-POUNDS.**
- Inspect area to be sure it is free of all foreign objects.
- On UH-60A helicopters, do this:
  - Hook cargo netting in aft section stowage compartment access opening.

STEP 8.1 REPLACE EXTENDED RANGE INTERCONNECT HOSE (CONT)

- Install soundproofing blanket.
- Install troop seats (TM 55-1520-237-23-5).

- On EH-60A helicopters, do this:
  - Install evaporator pallet and plenum (TM 55-1520-237-23-5).
  - Install condenser pallet and tighten supply ducting (TM 55-1520-237-23-5).

STEP 9 REPLACE FUEL BOOST PUMP

- Refuel fuel cells (TASK 11).
- Prime fuel system (TASK 12).

NOTE

- The following procedures apply to helicopters with MWO 55-1520-237-50-25 installed.
- The following procedures apply to both No. 1 and No. 2 fuel boost pumps.

DEFUEL

- Defuel fuel cells (TASK 11).
- Drain fuel cell sumps (TASK 11).
- Purge fuel cell of fumes (TM 55-1500-204-25/1).

REMOVE

- Turn off all electrical power.

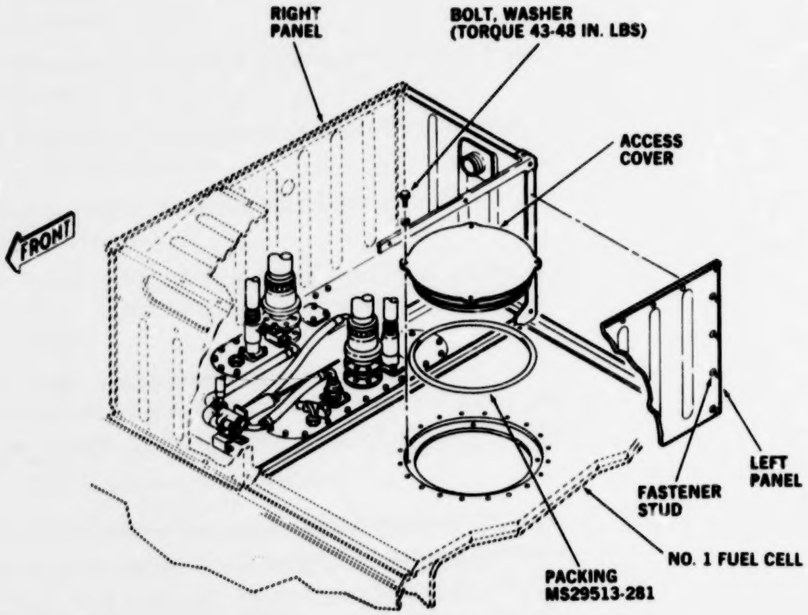

RIGHT PANEL
BOLT, WASHER (TORQUE 43-48 IN. LBS)
ACCESS COVER
FRONT
LEFT PANEL
FASTENER STUD
NO. 1 FUEL CELL
PACKING MS29513-281
S 67279.1 (C11)

Figure 13-9 (Sheet 1 of 3)

STEP 9 REPLACE FUEL BOOST PUMP (CONT)

- On UH-60A helicopters, do this:
  - Remove troop seats from rear cabin (TM 55-1520-237-23-5).
  - Remove soundproofing from left/right stowage compartment and center structure in cabin midsection.
  - Unhook cargo netting to get into compartment.
- On EH-60A helicopters, do this:
  - For access to No. 1 fuel cell, remove plenum and evaporator pallet (TM 55-1520-237-23-5).
  - For access to No. 2 fuel cell, remove condenser pallet and loosen supply ducting (TM 55-1520-237-23-5).

- Unlock fastener studs securing left/right panel enclosing fuel system components on top of fuel cells. Remove panel from compartment.

STEP 9 REPLACE FUEL BOOST PUMP (CONT)

- Remove screws and front panel from structure.
- Disconnect fuel boost pump electrical connector.
- Remove electrical connector from boost pump wiring harness (TM 55-1520-237-23-1).
- Remove insulation tubing from boost pump wiring harness.
- Remove sealing compound from scupper and wire leads, using a plastic scraper.
- Clean reworked area with dry-cleaning solvent, Fed. Spec P-D-680, Type II.
- Remove tiedown strap securing wire bundle to fuel outlet tube.
- Unbolt and remove access cover. Remove packing from cover.
- Remove clamps and bonding cables from pressure sensing hose, electrical wiring hose, and fuel hose.
- Inspect bonding cables, screws, and clamps, for corrosion. If corrosion is found replace effected hardware.
- Disconnect fuel hose from union in fuel boost pump.
- Disconnect pressure sensing hose from restrictor in fuel boost pump.
- Disconnect electrical wire hose from fitting on boost pump.
- Remove old sealing compound from edges of boost pump long bolt and washer with plastic scraper.
- Clean area with dry-cleaning solvent, Fed. Spec P-D-680, Type II.
- Unbolt and carefully remove boost pump and electrical wires from fuel cell.
- Remove restrictor and packing from boost pump.
- Remove union and packing from boost pump.
- Plug ports in boost pump.

STEP 9 REPLACE FUEL BOOST PUMP (CONT)

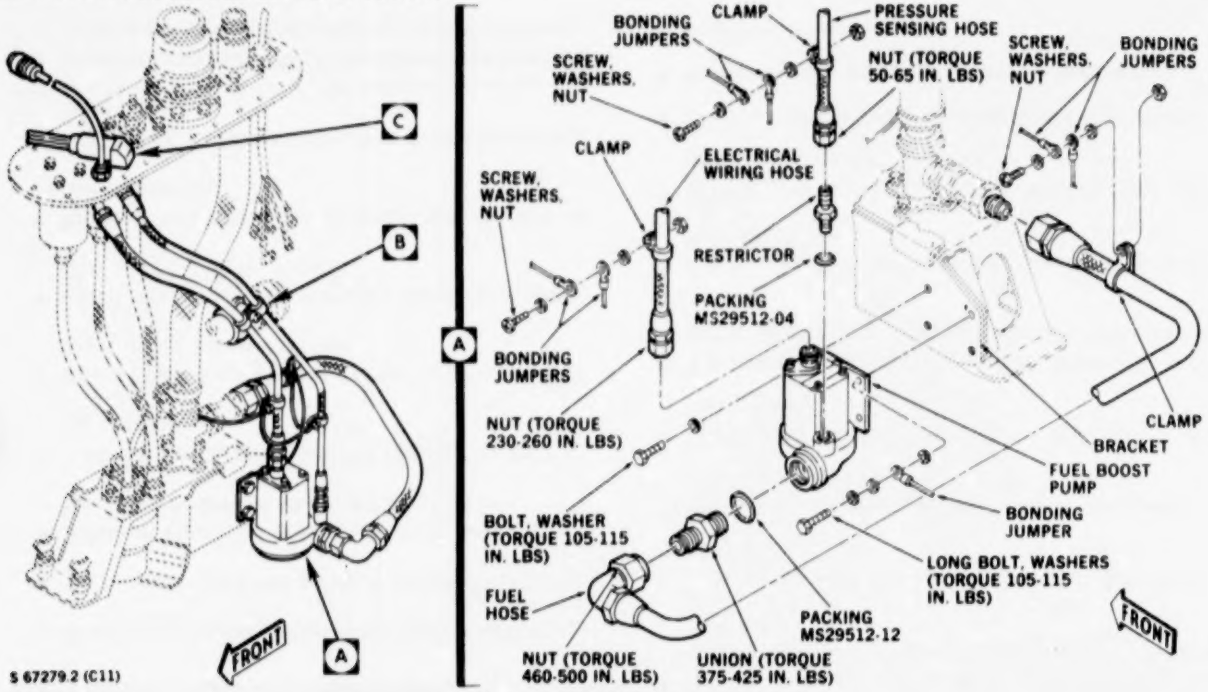
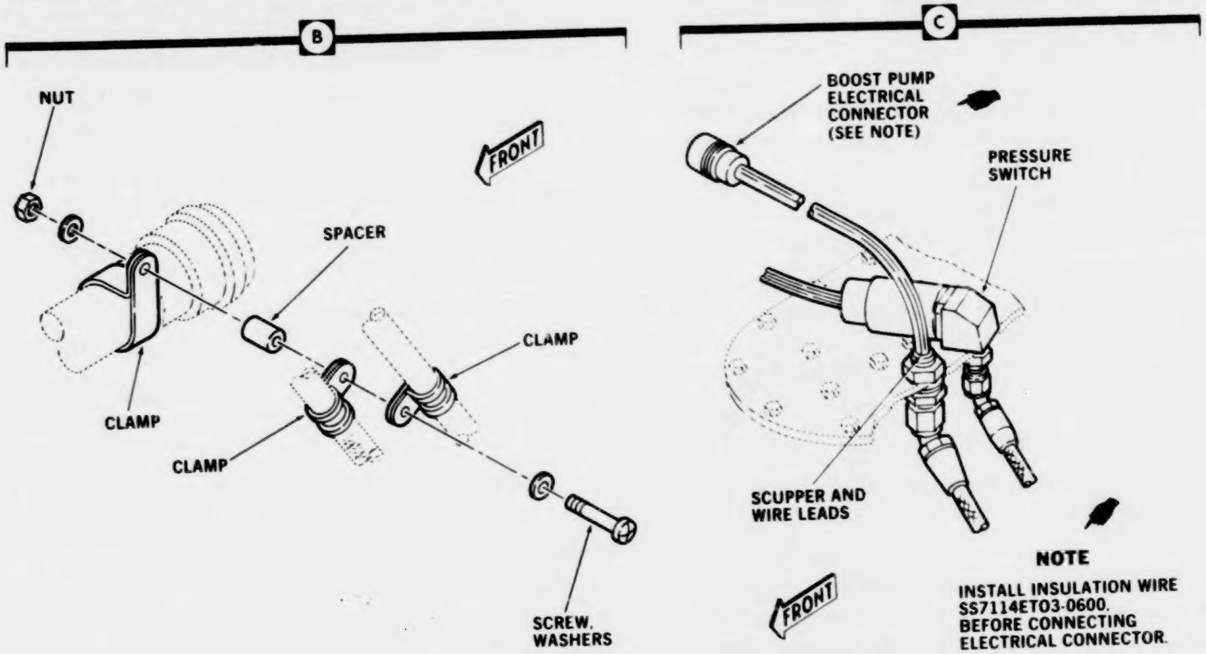

C
B
A
FRONT
A
S 67279.2 (C11)
BONDING JUMPERS
CLAMP
PRESSURE SENSING HOSE
SCREW, WASHERS, NUT
NUT (TORQUE 50-65 IN. LBS)
SCREW, WASHERS, NUT
BONDING JUMPERS
CLAMP
ELECTRICAL WIRING HOSE
SCREW, WASHERS, NUT
RESTRICTOR
PACKING MS29512-04
BONDING JUMPERS
NUT (TORQUE 230-260 IN. LBS)
CLAMP
BRACKET
FUEL BOOST PUMP
BOLT, WASHER (TORQUE 105-115 IN. LBS)
BONDING JUMPER
LONG BOLT, WASHERS (TORQUE 105-115 IN. LBS)
FUEL HOSE
PACKING MS29512-12
NUT (TORQUE 460-500 IN. LBS)
UNION (TORQUE 375-425 IN. LBS)
FRONT

Figure 13-9 (Sheet 2 of 3)

STEP 9 REPLACE FUEL BOOST PUMP (CONT)


B
NUT
FRONT
SPACER
CLAMP
CLAMP
CLAMP
CLAMP
SCREW, WASHERS
C
BOOST PUMP ELECTRICAL CONNECTOR (SEE NOTE)
PRESSURE SWITCH
SCUPPER AND WIRE LEADS
FRONT

NOTE

INSTALL INSULATION WIRE SS7114ET03-0600. BEFORE CONNECTING ELECTRICAL CONNECTOR.

S 67279.3 (C18)

Figure 13-9 (Sheet 3 of 3)

STEP 9 REPLACE FUEL BOOST PUMP (CONT)

INSTALL

- Measure electrical wires on new fuel boost pump. Wires must be at least 96 ± 1 inch long.
- If plugs were installed, remove them from ports in new boost pump.
- Coat threads of union with anti-seize compound, MIL-A-907.
- Coat packing, MS29512-12, with petrolatum, Fed. Spec VV-P-236. Install packing on union.
- Install union in port of boost pump. **TORQUE UNION TO 375 - 425 INCH-POUNDS.**
- Coat threads of restrictor with anti-seize compound, MIL-A-907.
- Coat packing, MS29512-04, with petrolatum, Fed. Spec VV-P-236. Install packing on restrictor.
- Install restrictor in port of boost pump.
- Temporarily install fuel boost pump on bracket using bolts and washers. Do not tighten bolts now.
- Locally make a wire snake from MS20995NC40, lockwire about 6-1/2 feet long. Make an eye on one end of lockwire. Tie ends of electrical wire to eye of lockwire.
- Carefully thread electrical wires through electrical wire hose. Remove lockwire from electrical wires.
- Remove bolt from top right corner of fuel boost pump.
- Install two washers, bonding cable, and one washer on long bolt. Install bolt and stackup in fuel boost pump. **TORQUE ALL BOLTS TO 105 - 115 INCH-POUNDS.**
- Seal edges of boost pump long bolt and washer to a diameter slightly larger than cleaned area with sealing compound, MIL-S-8802.
- Connect electrical wiring hose to fitting on boost pump. **TORQUE NUT ON HOSE TO 230 - 260 INCH-POUNDS.**
- Connect pressure sensing hose to restrictor on fuel boost pump. **TORQUE NUT ON HOSE TO 50 - 65 INCH-POUNDS.**

STEP 9 REPLACE FUEL BOOST PUMP (CONT)

- Connect fuel hose to union on fuel boost pump. **TORQUE NUT ON HOSE TO 460 - 500 INCH-POUNDS.**
- Position clamps on pressure sensing hose, electrical wiring hose, and fuel hose.

STEP 9 REPLACE FUEL BOOST PUMP (CONT)

- Connect bonding jumpers to clamps using screws, washers, and nuts.
- Install clamps on pressure sensing hose and electrical wiring hose. Connect clamps using screw, washers, spacer, and nut.
- Lubricate packing, MS29513-281, with petrolatum, Fed. Spec VV-P-236. Install packing on fuel cell access cover.
- Inspect work area to make certain it is clean and free of all tools.
- Coat threads of bolts with antiseize compound, MIL-A-907. Bolt access cover to fuel cell. **TORQUE BOLTS TO 43 - 48 INCH-POUNDS.**
- Secure wiring bundle to fuel outlet tube using tie-down strap, MS3367-7-9.
- Cut insulation tubing, SS7114ET03-0600, to length of wires and install over fuel boost pump electrical wires.
- Install fuel boost pump electrical wires to electrical connector (TM 55-1520-237-23-1).
- Seal edges of scupper and fill wire leads with sealing compound, MIL-S-8802 (Figure 13-9, Sheet 3, Detail C).
- Connect fuel boost pump electrical connector.
- Pressure test fuel system (TASK 18).
- Refuel fuel cells (TASK 11).
- Do an operational check (TM 55-1520-237-23-3).
- Install front panel using screws.
- Install left/right panel, enclosing fuel system components. Lock fastener studs.
- On UH-60A helicopters, do this:
  - Hook cargo netting in rear section stowage compartment access opening.
  - Install soundproofing.
  - Install troop seats (TM 55-1520-237-23-5).
- On EH-60A helicopters, do this:
  - Install evaporator pallet and plenum (TM 55-1520-237-23-5).
  - Install condenser pallet and tighten supply ducting (TM 55-1520-237-23-5).

STEP 10 REPLACE CHECK VALVE

NOTE

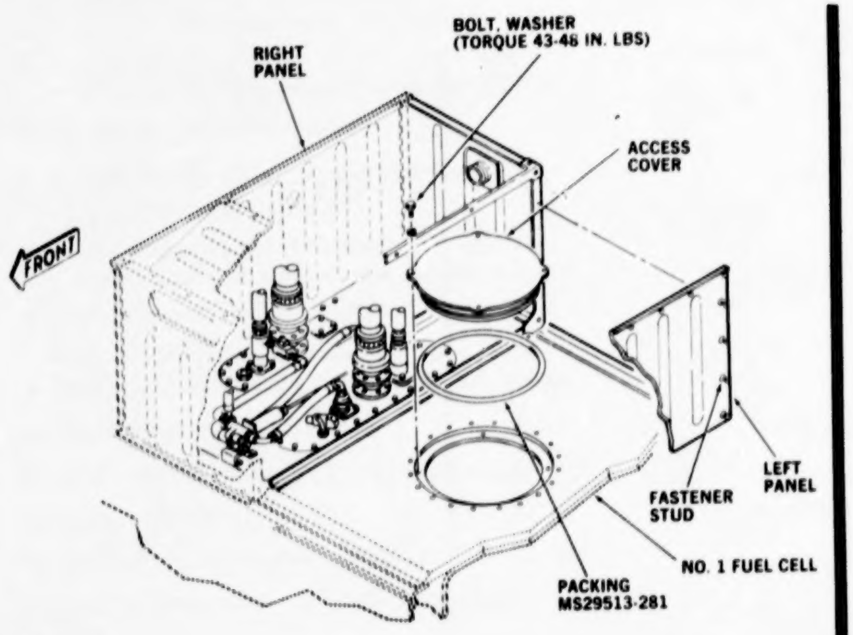
- The following procedures apply to helicopters with MWO 55-1520-237-50-25 installed.
- The following procedures apply to both No. 1 and No. 2 fuel boost pump check valves.

DEFUEL

- Defuel fuel cells (TASK 11).
- Drain fuel cell sumps (TASK 11).
- Purge fuel cells of fumes (TM 55-1500-204-25/1).

REMOVE

- Turn off all electrical power.
- Remove troop seats from midsection rear cabin (TM 55-1520-237-23-5).


BOLT, WASHER
(TORQUE 43-48 IN. LBS)
RIGHT PANEL
ACCESS COVER
FRONT
LEFT PANEL
FASTENER STUD
NO. 1 FUEL CELL
PACKING MS29513-281

S 67280.1 (C11)

Figure 13-10 (Sheet 1 of 2)

STEP 10 REPLACE CHECK VALVE (CONT)

- On UH-60A helicopters, do this:
  - Remove troop seats from rear cabin (TM 55-1520-237-23-5).
  - Remove soundproofing from left/right stowage compartment and center structure in cabin midsection.
  - Unhook cargo netting to get into compartment.
- On EH-60A helicopters, do this:
  - For access to No. 1 fuel cell, remove plenum and evaporator pallet (TM 55-1520-237-23-5).
  - For access to No. 2 fuel cell, remove condenser pallet and loosen supply ducting (TM 55-1520-237-23-5).
- Unlock fastener studs securing left/right panel enclosing fuel system components on top of fuel cells. Remove panel from compartment.
- Remove screws and front panel from structure.
- Unbolt and remove access cover. Remove packing from cover.

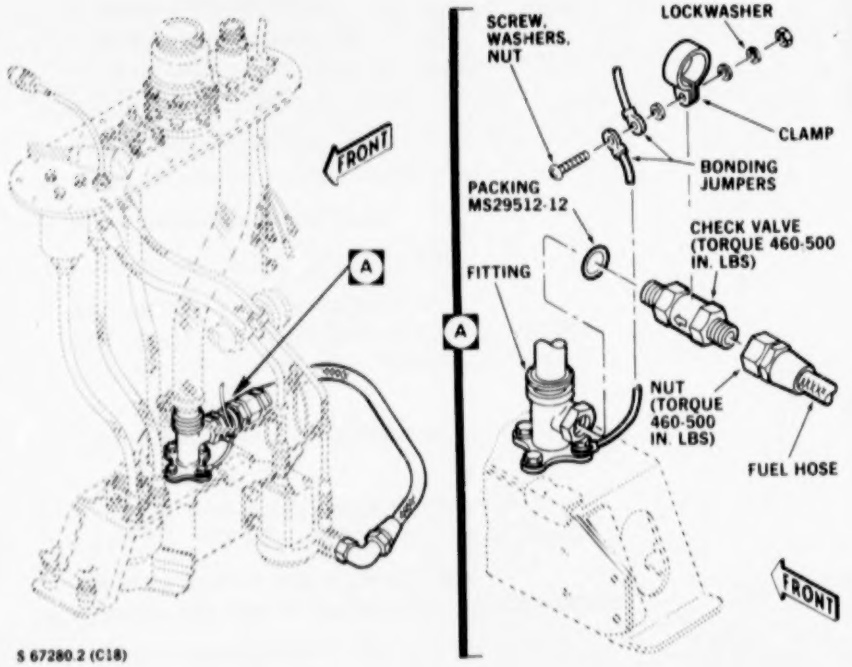

FRONT
A
S 67280.2 (C18)
SCREW, WASHERS, NUT
LOCKWASHER
CLAMP
BONDING JUMPERS
PACKING MS29512-12
CHECK VALVE (TORQUE 460-500 IN. LBS)
FITTING
A
NUT (TORQUE 460-500 IN. LBS)
FUEL HOSE
FRONT

Figure 13-10 (Sheet 2 of 2)

STEP 10 REPLACE CHECK VALVE (CONT)

- Remove clamp and bonding jumpers from check valve.
- Disconnect fuel hose from check valve.
- Remove check valve from fitting.
- Remove packing from check valve.

INSTALL

- Clean area where clamp is to be installed using a clean cloth dampened with dry-cleaning solvent, Fed. Spec P-D-680, Type II.
- Coat threads of check valve with antiseize compound, MIL-A-907.
- Coat packing, MS29512-12, with petrolatum, Fed. Spec VV-P-236, and install packing on end of check valve nearest head of arrow.
- Install check valve in fitting, with arrow pointing to fitting. **TORQUE CHECK VALVE TO 460 - 500 INCH-POUNDS.**
- Install clamp around cleaned area of check valve.
- Install bonding jumpers on clamp using screw, washers, lockwasher, and nut.
- Connect fuel hose to check valve. **TORQUE NUT ON HOSE TO 460 - 500 INCH-POUNDS.**
- Lubricate packing, MS29513-281, with petrolatum, Fed. Spec VV-P-236. Install packing on fuel cell access cover.
- Inspect work area to make certain it is clean and free of all tools.
- Coat threads of bolts with antiseize compound, MIL-A-907. Bolt access cover to fuel cell. **TORQUE BOLTS TO 43 - 48 INCH-POUNDS.**
- Pressure test fuel system (TASK 18).
- Install front panel using screws.
- Install left/right panel enclosing fuel system components. Lock fastener studs.
- On UH-60A helicopters, do this:
  - — Hook cargo netting in aft section stowage compartment access opening.
  - — Install soundproofing.
  - — Install troop seats (TM 55-1520-237-23-5).

STEP 10 REPLACE CHECK VALVE (CONT)

- On EH-60A helicopters, do this:
  - Install evaporator pallet and plenum (TM 55-1520-237-23-5).
  - Install condenser pallet and tighten supply ducting (TM 55-1520-237-23-5).
- Refuel fuel cells (TASK 11).
- Do an operational check (TM 55-1520-237-23-3).

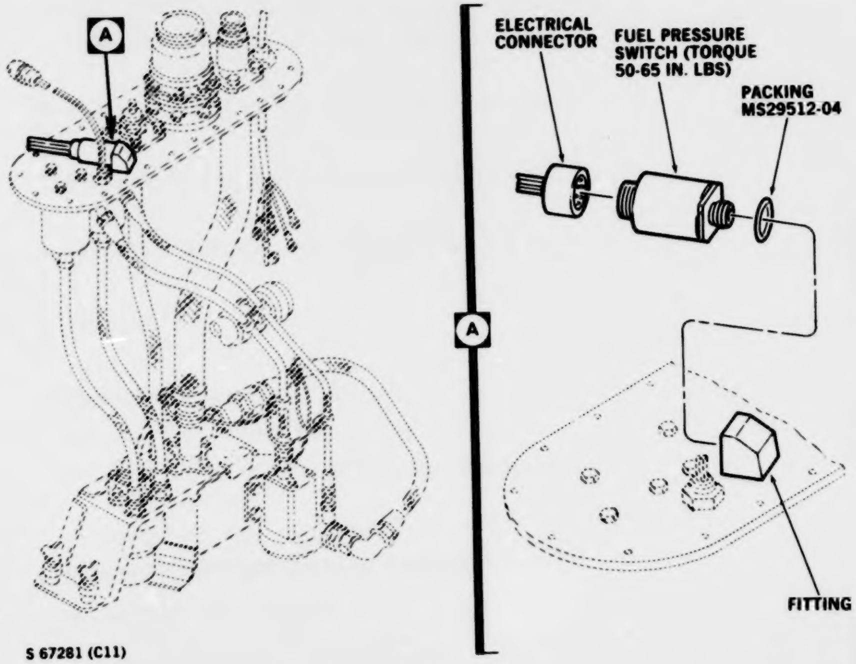
STEP 11 REPLACE FUEL PRESSURE SWITCH

REMOVE

NOTE

- The following procedures apply to helicopters with MWO 55-1520-237-50-25 installed.
- The following procedures apply to both No. 1 and No. 2 fuel pressure switches.

- Turn off all electrical power.
- On UH-60A helicopters, do this:
  - Remove troop seats from rear cabin (TM 55-1520-237-23-5).
  - Remove soundproofing from left/right stowage compartment and center structure in cabin midsection.
  - Unhook cargo netting to get into compartment.
  - Remove screws from front panel of fuel system components enclosure. Remove panel from structure.


A
ELECTRICAL CONNECTOR
FUEL PRESSURE SWITCH (TORQUE 50-65 IN. LBS)
PACKING MS29512-04
A
FITTING

S 67281 (C11)

Figure 13-11

STEP 11 REPLACE FUEL PRESSURE SWITCH (CONT)

- On EH-60A helicopters, do this:

  Deleted

  Deleted

  - Remove soundproofing panels from rear cabin bulkhead.
  - Remove screws from front panel of fuel system components enclosure. Remove panel from structure.
- Deleted.
- Disconnect electrical connector from fuel pressure switch.
- Remove pressure switch from fitting.
- Remove packing from pressure switch.

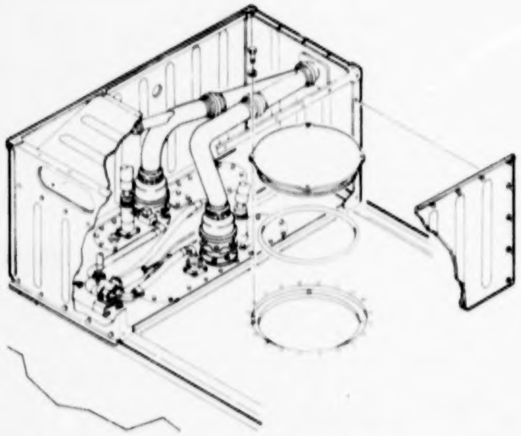
INSTALL

- Coat packing, MS29512-04, with petrolatum, Fed. Spec VV-P-236. Install packing on pressure switch.
- Install pressure switch in fitting. **TORQUE PRESSURE SWITCH TO 50 - 65 INCH-POUNDS.**
- Connect electrical connector on pressure switch.
- Do an operational check (TM 55-1520-237-23-3).
- Make sure area is free of foreign objects.
- Deleted.
- On UH-60A helicopters, do this:
  - Install front panel with screws.
  - Hook cargo netting in stowage compartment access opening.
  - Install soundproofing blanket.
  - Install troop seats (TM 55-1520-237-23-5).
- On EH-60A helicopters, do this:
  - Install front panel with screws.
  - Install soundproofing panels.

TASK 14

FUEL SYSTEM COMPONENTS - REPLACE

- REPLACE MAIN ENGINE PRIME FUEL SHUTOFF VALVE - STEP 1
- REPLACE SELF-SEALING BREAKAWAY VENT VALVE - STEP 2
- REPLACE SYSTEM VENT VALVE - STEP 3
- REPLACE MAIN FUEL BREAKAWAY VALVE - STEP 4
- REPLACE EXTENDED RANGE BREAKAWAY VALVE - STEP 4.1
- REPLACE PRIME/BOOST PUMP - STEP 5
- REPLACE PRIME/BOOST PUMP FUEL BREAKAWAY VALVE - STEP 6
- REPLACE CHECK VALVE - STEP 7
- REPLACE ENGINE COMPARTMENT BREAKAWAY VALVE - STEP 8
- REPLACE FUEL SELECTOR VALVE - STEP 9
- REPLACE CROSSFEED BREAKAWAY VALVE - STEP 10
- REPLACE BREAKAWAY TEE VALVE - STEP 11
- REPLACE BULKHEAD BREAKAWAY VALVE - STEP 12
- REPLACE PRIME/BOOST PUMP FUEL OUTLET VALVE - STEP 13
- REPLACE FUEL SYSTEM DRAIN/VENT LINES, LOWER FUSELAGE - STEP 14



S 45149 (B)

- **REPLACE FIXED ESSS FUEL SYSTEM BLEED-AIR LINES AND QUICK-DISCONNECTS - STEP 15**
- **REPLACE ESSS FUEL LINES AND QUICK-DISCONNECTS, STATION 312 TO STATION 398 - STEP 16**

PERSONNEL REQUIRED

- Two People Required: MOS 67T - Tactical Transport Helicopter Repairer
  Assistant

SUPPLIES

- Abrasive Cloth, P-C-451, NSN 5350-00-271-5950 (STEP 16)
- Adhesive, Pliobond No. 20, NSN 8040-00-200-9190 (STEP 16)
- Deleted
- Antiseize Compound, MIL-A-907 (STEPS 1, 2, 3, 4, 4.1, 5, 6, 12, 13, 14)
- Degreasing Solvent O-T-620, NSN 6810-00-930-6311 (STEP 16)
- Dry-Cleaning Solvent, Fed. Spec P-D-680, Type II, NSN 6850-00-274-5421 (STEP 12)
- Gasket, MS27196-16 (1 Required, STEP 8)
  (1 Required, STEP 9)
- Grommet, MS35489-6 (2 Required, STEP 14)
- Grommet, MS35489-17 (2 Required, STEP 14)
- Masking Tape, Fed. Spec PPP-T-45C (STEP 8)
- Packing, MS29512-06 (1 Required, STEP 1)
  (2 Required, STEP 14)
- Packing, MS29512-08 (2 Required, STEP 5)
  (1 Required, STEP 13)
- Packing, MS29512-10 (2 Required, STEP 15)
- Packing, MS29512-012 (1 Required, STEP 7)
  (1 Required, STEP 11)

SUPPLIES (CONT)

- Packing, MS9068-013 (1 Required, STEP 14)
- Packing, MS29513-211 (1 Required, STEP 9)
  (1 Required, STEP 10)
- Packing, MS29513-215 (2 Required, STEP 4)
  (2 Required, STEP 4.1)
  (1 Required, STEP 9)
  (1 Required, STEP 11)
  (2 Required, STEP 12)
  (1 Required, STEP 14)
  (1 Required, STEP 15)
- Packing, MS29513-230 (2 Required, STEP 2)
  (2 Required, STEP 3)
  (6 Required, STEP 14)
- Packing, MS29513-239 (1 Required, STEP 2)
- Packing, MS29513-281 (1 Required, STEP 4)
  (1 Required, STEP 4.1)
  (1 Required, STEP 6)
- Petrolatum, Fed. Spec VV-P-236, NSN 9150-00-250-0926 (STEPS 1, 2, 4, 4.1, 5, 6, 7, 10, 11, 12, 13, 14)
- Plastic Scraper (STEP 12)
- Seal, MS27195-16 (2 Required, STEP 9)
  (1 Required, STEP 10)
  (1 Required, STEP 11)
- Seal, MS27195-32 (1 Required, STEP 4)
  (1 Required, STEP 4.1)
  (1 Required, STEP 6)

SUPPLIES (CONT)

- Seal, MS27195-40 (1 Required, STEP 2)
  (1 Required, STEP 3)
- Sealing Compound, MIL-S-8802 (STEP 12)
- Trichloroethane, O-T-620, NSN 6810-00-930-6311 (STEP 16)
- Washer, Sealing, NAS1598D7Y (2 Required, STEP 14)
- Washer, Sealing, NAS1598D10Y (2 Required, STEP 14)

TOOLS

- Aircraft Mechanic's Toolkit, NSN 5180-00-323-4692
- Torque Wrench, 30 - 150 in-lbs, NSN 5120-00-542-4489 (STEPS 1, 4, 5, 6, 13, 14)
- Torque Wrench, 150 - 750 in-lbs, NSN 5120-00-821-3441 (STEPS 2, 3, 7, 9, 11, 14, 15)

ALSO NEEDED

- Protective Plugs and Caps (STEPS 1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15)
- Suitable Empty Container (STEPS 1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15)
- TASK 11 (STEPS 4, 4.1, 6)
- TASK 12 (STEPS 1, 5, 7, 8, 9, 10, 11, 12, 13)
- TASK 17 (STEP 5)
- TM 55-1500-204-25/1 (STEPS 4, 4.1, 6)
- TM 55-1520-237-23-3 (STEPS 2, 3, 4.1, 15)
- TM 55-1520-237-23-5 (STEPS 1, 2, 3, 4, 4.1, 5, 6, 12, 13, 14, 15)

STEP 1 REPLACE MAIN ENGINE PRIME FUEL SHUTOFF VALVE

NOTE

The following procedures apply to both No. 1 and No. 2 main engine prime fuel shutoff valves.

REMOVE

- Turn off all electrical power.
- On UH-60A helicopters, do this:
    - Remove troop seats from rear cabin (TM 55-1520-237-23-5).
    - Remove soundproofing blanket from left/right stowage compartment and center structure in cabin midsection.
    - Unhook cargo netting to get into compartment.
    - Remove screws from front panel of fuel system components enclosure. Remove panel from structure.
- On EH-60A helicopters, do this:
    - Remove soundproofing panels from rear cabin bulkhead.
    - Remove screws from front panel of fuel system components enclosure. Remove panel from structure.

STEP 1 REPLACE MAIN ENGINE PRIME FUEL SHUTOFF VALVE (CONT)

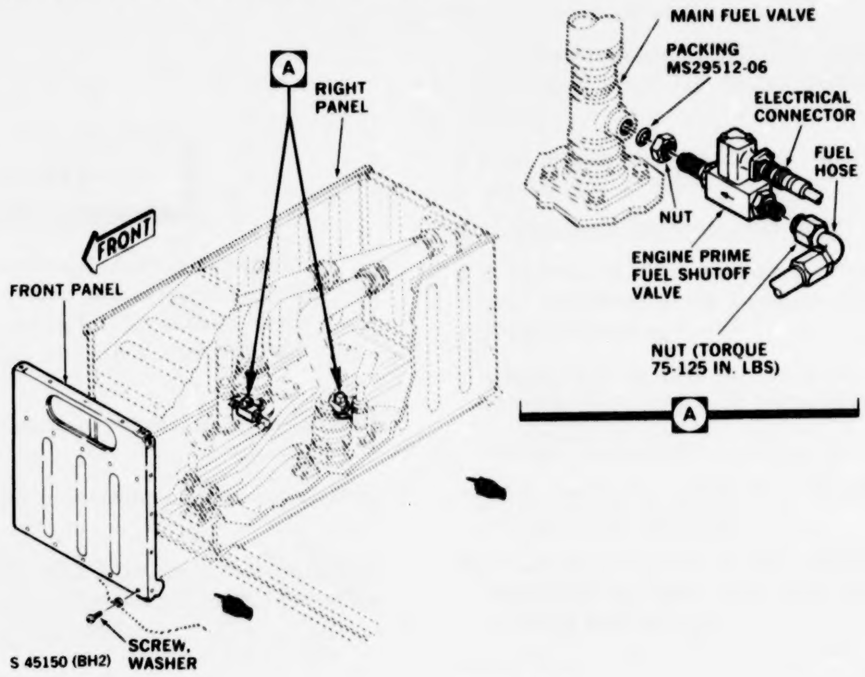

A
RIGHT PANEL
FRONT
FRONT PANEL
S 45150 (BH2)
SCREW, WASHER
MAIN FUEL VALVE
PACKING MS29512-06
ELECTRICAL CONNECTOR
FUEL HOSE
NUT
ENGINE PRIME FUEL SHUTOFF VALVE
NUT (TORQUE 75-125 IN. LBS)
A

Figure 14-1

STEP 1 REPLACE MAIN ENGINE PRIME FUEL SHUTOFF VALVE (CONT)

- Prime fuel system (TASK 12).
- Inspect area and be sure it is free of foreign objects, then enclose fuel system components.
- Deleted.
- On UH-60A helicopters, do this:
  - Hook cargo netting in stowage compartment access opening.
  - Install soundproofing blanket.
  - Install troop seats (TM 55-1520-237-23-5).
- On EH-60A helicopters, do this:
  - Install front panel with screws.
  - Install soundproofing panels.

STEP 2 REPLACE SELF-SEALING BREAKAWAY VENT VALVE

NOTE

The following procedures apply to both No. 1 and No. 2 fuel cell self-sealing breakaway vent valves.

REMOVE

- Turn off all electrical power.
- On UH-60A helicopters, do this:
  - — Remove troop seats from rear cabin (TM 55-1520-237-23-5).
  - — Remove soundproofing blanket from left/right stowage compartment and center structure in cabin midsection.
  - — Unhook cargo netting to get into compartment.
  - — Unlock fastener studs holding left/right panel enclosing fuel system components on top of fuel cells. Remove panel from compartment.

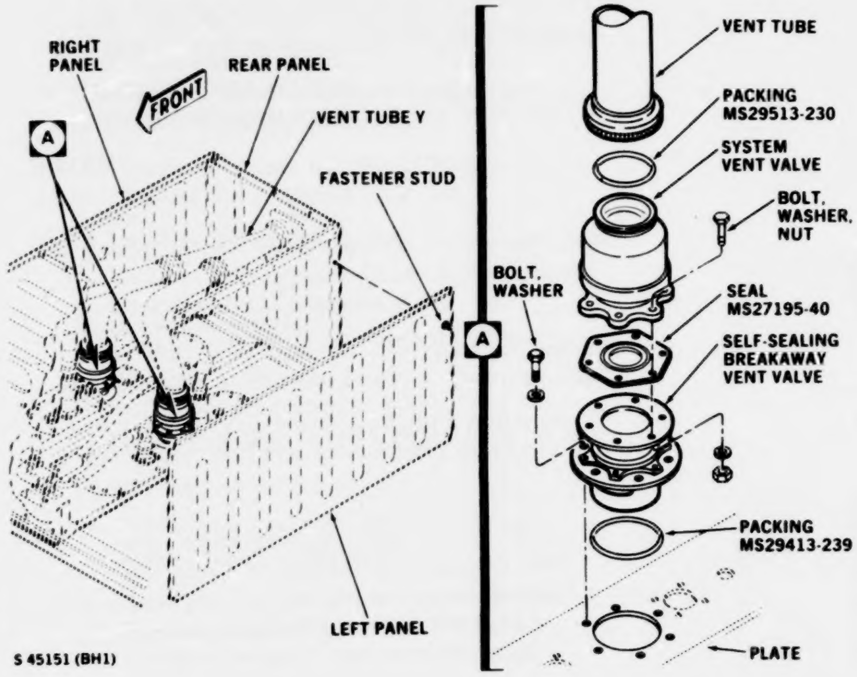

RIGHT PANEL
FRONT
REAR PANEL
A
VENT TUBE Y
FASTENER STUD
LEFT PANEL
S 45151 (BH1)
A
VENT TUBE
PACKING MS29513-230
SYSTEM VENT VALVE
BOLT, WASHER, NUT
BOLT, WASHER
SEAL MS27195-40
SELF-SEALING BREAKAWAY VENT VALVE
PACKING MS29413-239
PLATE

Figure 14-2

STEP 2 REPLACE SELF-SEALING BREAKAWAY VENT VALVE (CONT)

- On EH-60A helicopters, do this:
  - Remove soundproofing panels from rear cabin bulkhead.
  - Remove screws from front panel of fuel system components enclosure. Remove panel from structure.
- Deleted.

WARNING

To prevent damage to equipment or personnel injury, follow normal fire precautions while doing this job.

CAUTION

Breakaway valves can be damaged if installed improperly. Valves contain frangible sections that damage easily. To prevent damage to self-sealing breakaway vent valves, use care when installing valve or disconnecting/connecting vent tubes and fuel lines.

- Disconnect vent tube from system vent valve and vent tube Y. Remove packings from vent tube.
- Unbolt system vent valve from self-sealing breakaway vent valve. Remove seal from self-sealing breakaway vent valve.
- Unbolt self-sealing breakaway vent valve from plate.

INSTALL

- Lubricate packing, MS29513-239, with petrolatum, Fed. Spec VV-P-236.
- Install packing in groove on self-sealing breakaway vent valve mounting flange.
- Coat threads of bolts with antiseize compound, MIL-A-907.

STEP 2 REPLACE SELF-SEALING BREAKAWAY VENT VALVE (CONT)

CAUTION

Breakaway valves can be damaged if installed improperly. Valves contain frangible sections that damage easily. To prevent damage to self-sealing breakaway vent valves, use care when installing valve or disconnecting/connecting vent tubes and fuel lines.

- Bolt self-sealing breakaway vent valve to plate.
- Install seal, MS27195-40, between system vent valve and self-sealing breakaway vent valve.
- Coat threads of bolts with antiseize compound, MIL-A-907.
- Install self-sealing breakaway vent valve onto system vent valve with bolt, washer, and nut. **TORQUE NUT TO 156 - 173 INCH-POUNDS**.
- Lubricate packings, MS29513-230, with petrolatum, Fed. Spec VV-P-236. Install packing in groove on vent tube ends.
- Connect vent tube to vent tube Y and system vent valve. **HANDTIGHTEN CONNECTOR**.
- Check area to be sure it is free of foreign objects, then enclose fuel system components.
- On UH-60A helicopters, do this:
  - Install left/right panel enclosing fuel system components. Lock fastener studs.
  - Hook cargo netting in stowage compartment access opening.
  - Install soundproofing blanket.
  - Install troop seats (TM 55-1520-237-23-5).
- On EH-60A helicopters, do this:
  - Install front panel with screws.
  - Install soundproofing panels.
- Operational check system for reason for component replacement (TM 55-1520-237-23-3).

STEP 3 REPLACE SYSTEM VENT VALVE

NOTE

The following procedures apply to both No. 1 and No. 2 fuel cell system vent valves.

REMOVE

- Turn off all electrical power.
- On UH-60A helicopters, do this:
  - Remove troop seats from rear cabin (TM 55-1520-237-23-5).
  - Remove soundproofing blanket from left/right stowage compartment and center structure in cabin midsection.
  - Unhook cargo netting to get into compartment.
  - Unlock fastener studs holding left/right panel enclosing fuel system components on top of fuel cells. Remove panel from compartment.

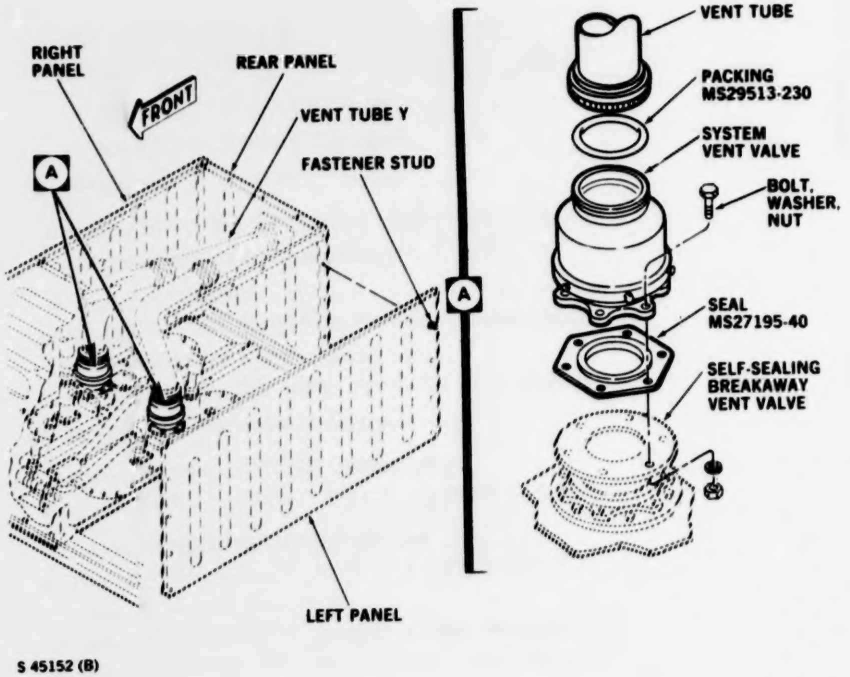

RIGHT PANEL
FRONT
REAR PANEL
VENT TUBE Y
FASTENER STUD
A
A
LEFT PANEL
VENT TUBE
PACKING MS29513-230
SYSTEM VENT VALVE
BOLT, WASHER, NUT
SEAL MS27195-40
SELF-SEALING BREAKAWAY VENT VALVE
S 45152 (B)

Figure 14-3

STEP 3 REPLACE SYSTEM VENT VALVE (CONT)

- On EH-60A helicopters, do this:
  - Remove soundproofing panels from rear cabin bulkhead.
  - Remove screws from front panel of fuel system components enclosure. Remove panel from structure.
- Deleted.

WARNING

To prevent personal injury or damage to equipment, follow normal fire precautions while doing this job.

CAUTION

Breakaway valves can be damaged if installed improperly. Valves contain frangible sections that damage easily. To prevent damage to self-sealing breakaway vent valves, use care when installing valve or disconnecting/connecting vent tubes and fuel lines.

- Disconnect vent tube from system vent valve and vent tube Y. Remove packings from vent tube.
- Unbolt system vent valve from self-sealing breakaway vent valve. Remove seal from self-sealing breakaway vent valve.

INSTALL

- Install seal, MS27195-40, between system vent valve and self-sealing breakaway vent valve.
- Coat threads of bolts with antiseize compound, MIL-A-907.

STEP 3 REPLACE SYSTEM VENT VALVE (CONT)

CAUTION

Breakaway valves can be damaged if installed improperly. Valves contain frangible sections that damage easily. To prevent damage to self-sealing breakaway vent valves, use care when installing valve or disconnecting/connecting vent tubes and fuel lines.

- Install system vent valve onto self-sealing breakaway vent valve with bolts, washers, and nuts. **TORQUE BOLTS TO 156 - 173 INCH-POUNDS.**
- Lubricate packings, MS29513-230, with petrolatum, Fed. Spec VV-P-236.
- Install packing in groove on vent tube ends.
- Connect vent tube to system vent valve and vent tube Y. **HANDTIGHTEN CONNECTOR.**
- Check area to be sure it is free of foreign objects, then enclose fuel system components.
- On UH-60A helicopters, do this:
  - Install left/right panel enclosing fuel system components. Lock fastener studs.
  - Hook cargo netting in stowage compartment access opening.
  - Install soundproofing blanket.
  - Install troop seats (TM 55-1520-237-23-5).
- On EH-60A helicopters, do this:
  - Install front panel with screws.
  - Install soundproofing panels.
- Operational check system for reason for component replacement (TM 55-1520-237-23-3).

STEP 4 REPLACE MAIN FUEL BREAKAWAY VALVE

NOTE

The following procedures apply to both No. 1 and No. 2 fuel cell main fuel breakaway valves.

DEFUEL

- Pressure defuel fuel cells (TASK 11).
- Purge fuel cell of fumes (TM 55-1500-204-25/1).

REMOVE

- Turn off all electrical power.
- On UH-60A helicopters, do this:
  - Remove troop seats from rear cabin (TM 55-1520-237-23-5).
  - Remove soundproofing from left/right stowage compartment and center structure in cabin midsection.
  - Unhook cargo netting to get into compartment.
- On EH-60A helicopters, do this:
  - For access to No. 1 fuel cell, remove plenum and evaporator pallet (TM 55-1520-237-23-5).
  - For access to No. 2 fuel cell, remove condenser pallet and loosen supply ducting (TM 55-1520-237-23-5).
- Unlock fastener studs holding left/right panel enclosing fuel system components on top of fuel cells. Remove panel from compartment.

WARNING

To prevent personal injury or damage to equipment, follow normal fire precautions while doing this job. Use suitable container to catch fuel when draining fuel lines.

- Unbolt and remove fuel cell access cover. Remove packing from cover.

STEP 4 REPLACE MAIN FUEL BREAKAWAY VALVE (CONT)

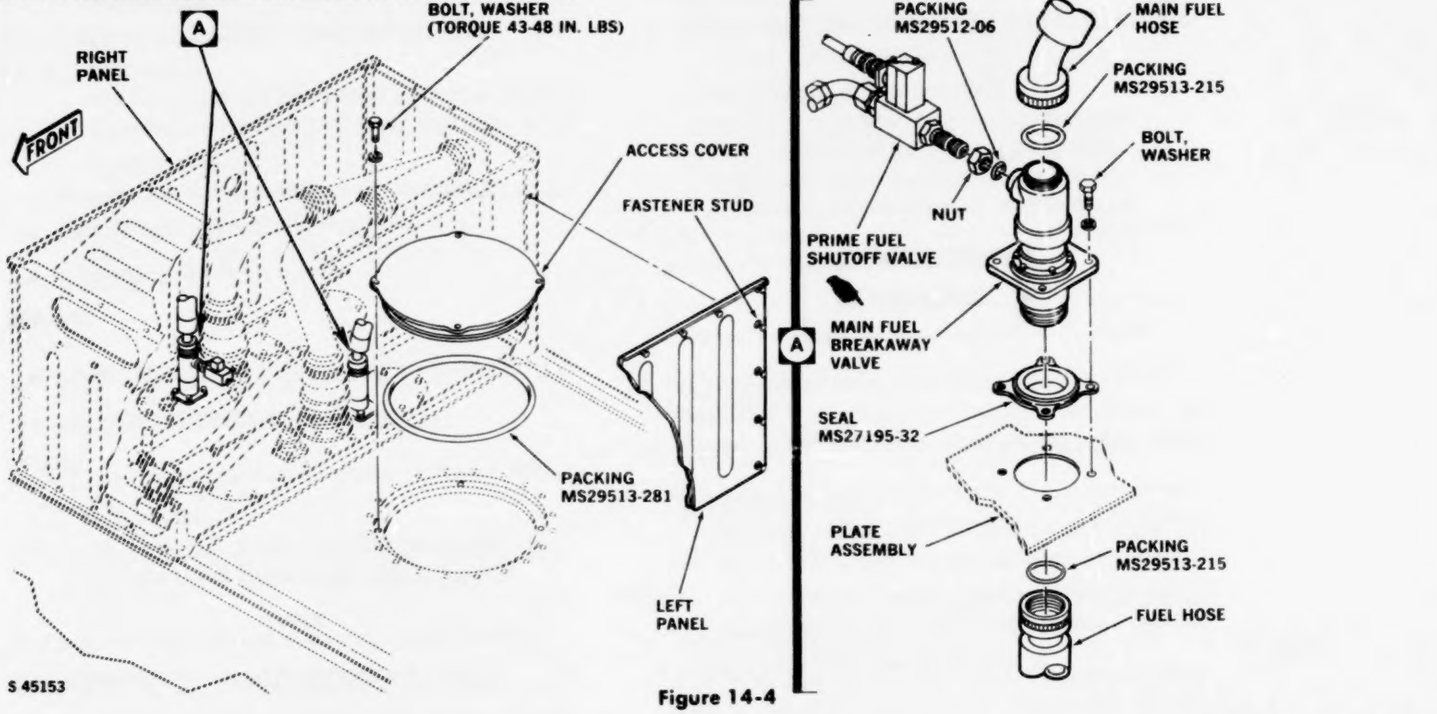

A
BOLT, WASHER
(TORQUE 43-48 IN. LBS)
RIGHT PANEL
FRONT
ACCESS COVER
FASTENER STUD
PACKING MS29513-281
LEFT PANEL
S 45153
A
PACKING MS29512-06
MAIN FUEL HOSE
PACKING MS29513-215
BOLT, WASHER
NUT
PRIME FUEL SHUTOFF VALVE
MAIN FUEL BREAKAWAY VALVE
SEAL MS27195-32
PLATE ASSEMBLY
PACKING MS29513-215
FUEL HOSE

Figure 14-4

Pages 14-14.1 thru 14-14.3/14-14.4 deleted.

STEP 4.1 REPLACE EXTENDED RANGE BREAKAWAY VALVE

NOTE

The following procedure applies only to No. 2 fuel cell on helicopters serial Nos 82-23748 or with extended range kit installed.

REMOVE

- Defuel helicopter (TASK 11).
- Purge fuel cell (TM 55-1500-204-25/1).
- Remove troop seats from midsection rear cabin (TM 55-1520-237-23-5).
- Remove soundproofing blanket from left/right stowage compartment in cabin midsection.
- Unhook cargo netting to get into compartment.
- Unlock fastener studs holding left/right panel enclosing fuel system components on top of fuel cells. Remove panel from compartment.

WARNING

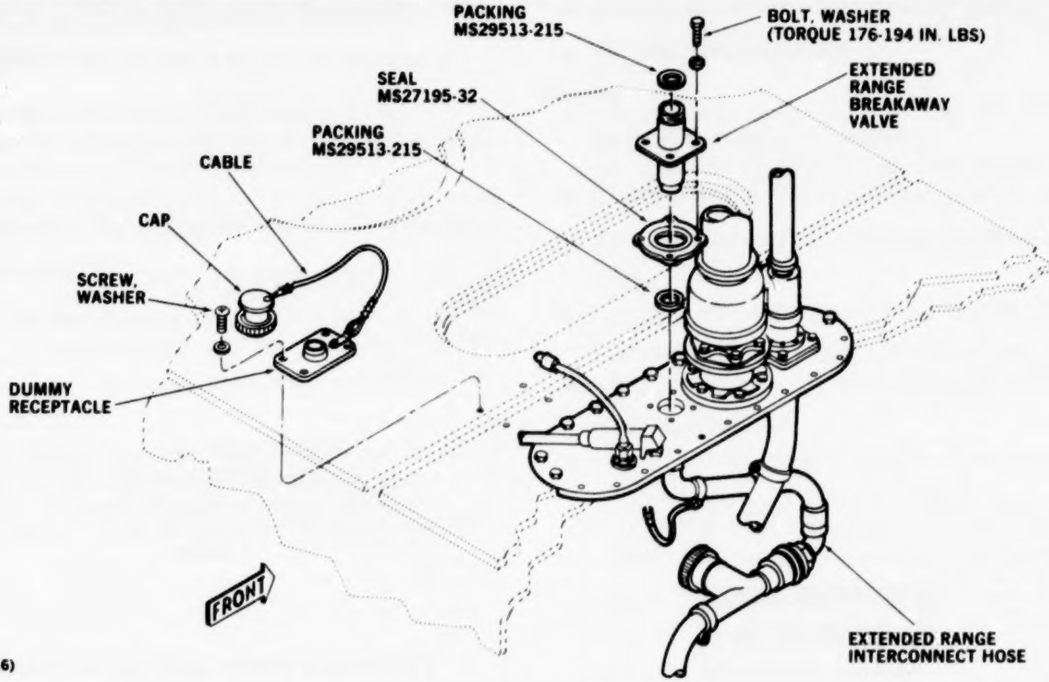
To prevent injury to personnel or damage to equipment, follow normal fire precautions while doing this job.

- Unbolt and remove fuel cell acess cover. Remove packing from cover.
- Reach inside fuel cell and disconnect fuel hose attached to bottom breakaway valve. Plug hose.
- Unscrew cap from valve and store on dummy receptacle.
- Remove bolts, washers, and breakaway valve.
- If required, remove screws and dummy receptacle. Remove cable from cap and receptacle by spreading hooks.

INSTALL

- Turn off all electrical power.
- If removed, secure cap to dummy receptacle with cable by bending hooks closed. Install dummy receptacle on cover panels with screws and washers.

STEP 4.1 REPLACE EXTENDED RANGE BREAKAWAY VALVE (CONT)


PACKING
MS29513-215
BOLT, WASHER
(TORQUE 176-194 IN. LBS)
SEAL
MS27195-32
EXTENDED
RANGE
BREAKAWAY
VALVE
PACKING
MS29513-215
CABLE
CAP
SCREW,
WASHER
DUMMY
RECEPTACLE
FRONT
EXTENDED RANGE
INTERCONNECT HOSE

S 73055 (C16)

Figure 14-4.1

STEP 4.1 REPLACE EXTENDED RANGE BREAKAWAY VALVE (CONT)

- Lubricate packings, MS29513-215, with petrolatum, Fed. Spec VV-P-236. Install packings on extended range breakaway valve.
- Install seal, MS27195-32, lubricated with petrolatum, Fed. Spec VV-P-236, and breakaway valve on plate.
- Coat threads of bolts with anti-seize compound, MIL-A-907. Install bolts and washers in breakaway valve. **TORQUE BOLTS TO 176 - 194 INCH-POUNDS.**
- Install cap on top of extended range breakaway valve.
- Uncap and install extended range interconnect hose on bottom of breakaway valve.
- Check area to be sure it is free of foreign objects.
- Coat packing, NAS1593-281, with petrolatum, Fed. Spec VV-P-236. Install packing on fuel cell access cover.
- Bolt fuel cell access cover to fuel cell. **TORQUE BOLTS TO 43 - 48 INCH-POUNDS.**
- Refuel fuel cells (TASK 11).
- Do an operational check of fuel system (TM 55-1520-237-23-3).
- Install left/right panel enclosing fuel system components. Lock fastener studs.
- Hook cargo netting in stowage compartment access opening.
- Install soundproofing blanket.
- Install troop seats (TM 55-1520-237-23-5).

STEP 4 REPLACE MAIN FUEL BREAKAWAY VALVE (CONT)

- Reach inside fuel cell and disconnect fuel hose attached to bottom of main fuel breakaway valve. Plug hose.
- Remove prime fuel shutoff valve from main fuel breakaway valve (STEP 1). Cap shutoff valve.
- Disconnect main fuel hose from top of main fuel breakaway valve. Plug hose.
- Unbolt main fuel breakaway valve from plate. Remove seal.
- Remove packings from main fuel breakaway valve.

INSTALL

- Turn off all electrical power.
- Lubricate packings, MS29513-215, with petrolatum, Fed. Spec VV-P-236. Install packings on main fuel valve.
- Coat threads of bolts and threads on main fuel valve with antiseize compound, MIL-A-907.
- Install seal, MS27195-32, on main fuel valve and bolt valve to plate assembly
- Unplug and connect main fuel hose to top of main fuel breakaway valve. **HANDTIGHTEN CONNECTOR.**
- Uncap and install prime fuel shutoff valve on main fuel breakaway valve (STEP 1).
- Reach inside fuel cell. Unplug and connect fuel hose to bottom of main fuel breakaway valve.
- Coat threads of bolts with antiseize compound, MIL-A-907.
- Coat packing, MS29513-281, with petrolatum, Fed. Spec VV-P-236. Install packing on fuel cell access cover.
- Bolt fuel cell access cover to fuel cell. **TORQUE BOLTS TO 43 - 48 INCH-POUNDS.**
- Refuel fuel cells (TASK 11).

STEP 4 REPLACE MAIN FUEL BREAKAWAY VALVE (CONT)

- With electrical power on, operate prime pump to pressurize system.
- Check system for leaks. If leakage is found, make sure all connections are properly tightened, or install new seal or packings.
- Check area to be sure it is free of foreign objects.
- Install left/right panel enclosing fuel system components. Lock fastener studs.
- On UH-60A helicopters, do this:
    - Hook cargo netting in aft section stowage compartment access opening.
    - Install soundproofing.
    - Install troop seats (TM 55-1520-237-23-5).
- On EH-60A helicopters, do this:
    - Install evaporator pallet and plenum (TM 55-1520-237-23-5).
    - Install condenser pallet and tighten supply ducting (TM 55-1520-237-23-5).

STEP 4.1 REPLACE EXTENDED RANGE BREAKAWAY VALVE

NOTE

The following procedure applies only to No. 2 fuel cell on helicopters serial Nos 82-23748 and subsequent, or with extended range kit installed.

REMOVE

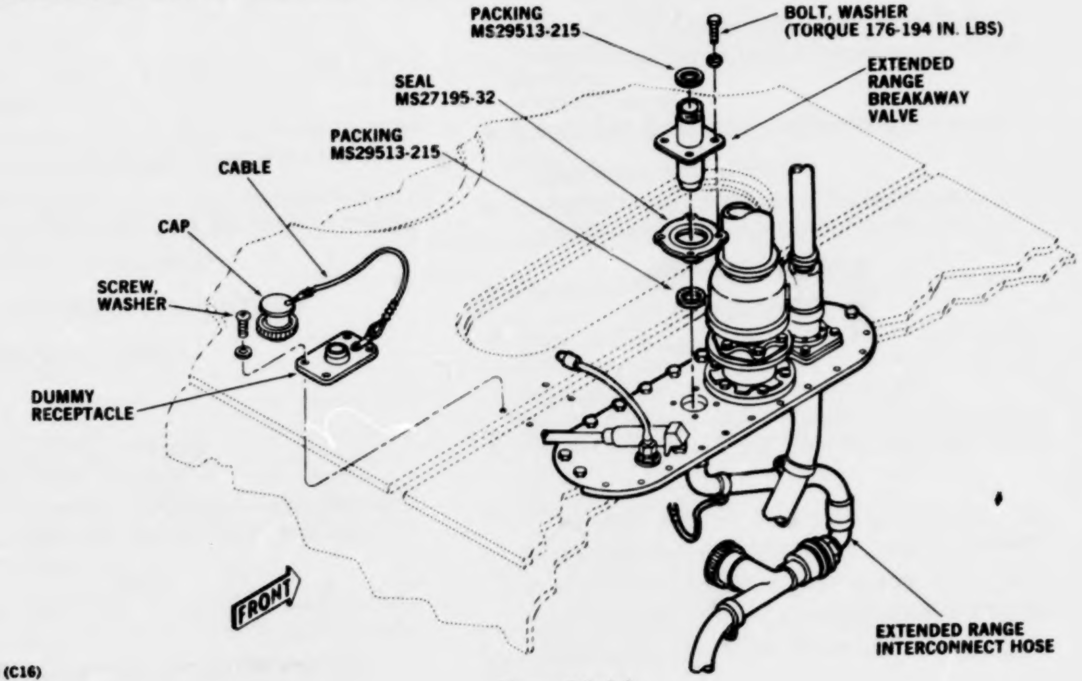
- Defuel helicopter (TASK 11).
- Purge fuel cell (TM 55-1500-204-25/1).
- On UH-60A helicopters, do this:
  - Remove troop seats from rear cabin (TM 55-1520-237-23-5).
  - Remove soundproofing from left/right stowage compartment and center structure in cabin midsection.
  - Unhook cargo netting to get into compartment.
- On EH-60A helicopters, do this:
  - For access to No. 1 fuel cell, remove plenum and evaporator pallet (TM 55-1520-237-23-5).
  - For access to No. 2 fuel cell, remove condenser pallet and loosen supply ducting (TM 55-1520-237-23-5).
- Unlock fastener studs holding left/right panel enclosing fuel system components on top of fuel cells. Remove panel from compartment.

WARNING

To prevent injury to personnel or damage to equipment, follow normal fire precautions while doing this job.

- Unbolt and remove fuel cell acess cover. Remove packing from cover.
- Reach inside fuel cell and disconnect fuel hose attached to bottom breakaway valve. Plug hose.

STEP 4.1 REPLACE EXTENDED RANGE BREAKAWAY VALVE (CONT)


PACKING
MS29513-215
BOLT, WASHER
(TORQUE 176-194 IN. LBS)
EXTENDED
RANGE
BREAKAWAY
VALVE
SEAL
MS27195-32
PACKING
MS29513-215
CABLE
CAP
SCREW,
WASHER
DUMMY
RECEPTACLE
FRONT
EXTENDED RANGE
INTERCONNECT HOSE

S 73055 (C16)

Figure 14-4.1

STEP 4.1 REPLACE EXTENDED RANGE BREAKAWAY VALVE (CONT)

- Unscrew cap from valve and store on dummy receptacle.
- Remove bolts, washers, and breakaway valve.
- If required, remove screws and dummy receptacle. Remove cable from cap and receptacle by spreading hooks.

INSTALL

- Turn off all electrical power.
- If removed, secure cap to dummy receptacle with cable by bending hooks closed. Install dummy receptacle on cover panels with screws and washers.
- Lubricate packings, MS29513-215, with petrolatum, Fed. Spec VV-P-236. Install packings on extended range breakaway valve.
- Install seal, MS27195-32, lubricated with petrolatum, Fed. Spec VV-P-236, and breakaway valve on plate.
- Coat threads of bolts with antiseize compound, MIL-A-907. Install bolts and washers in breakaway valve. **TORQUE BOLTS TO 176 - 194 INCH-POUNDS.**
- Install cap on top of extended range breakaway valve.
- Uncap and install extended range interconnect hose on bottom of breakaway valve.
- Check area to be sure it is free of foreign objects.
- Coat packing, MS29513-281, with petrolatum, Fed. Spec VV-P-236. Install packing on fuel cell access cover.
- Bolt fuel cell access cover to fuel cell. **TORQUE BOLTS TO 43 - 48 INCH-POUNDS.**
- Refuel fuel cells (TASK 11).
- Do an operational check of fuel system (TM 55-1520-237-23-3).
- Install left/right panel enclosing fuel system components. Lock fastener studs.

STEP 4.1 REPLACE EXTENDED RANGE BREAKAWAY VALVE (CONT)

- On UH-60A helicopters, do this:
  - Hook cargo netting in aft section stowage compartment access opening.
  - Install soundproofing.
  - Install troop seats (TM 55-1520-237-23-5).
- On EH-60A helicopters, do this:
  - Install evaporator pallet and plenum (TM 55-1520-237-23-5).
  - Install condenser pallet and tighten supply ducting (TM 55-1520-237-23-5).

STEP 5 REPLACE PRIME/BOOST PUMP

REMOVE

- Turn off all electrical power.
- On UH-60A helicopters, do this:
  - Remove troop seats from rear cabin (TM 55-1520-237-23-5).
  - Remove soundproofing blanket from left/right stowage compartment and center structure in cabin midsection.
  - Unhook cargo netting to get into compartment.
  - Remove screws from front panel of fuel system components enclosure. Remove panel from structure.
- On EH-60A helicopters, do this:
  - Remove soundproofing panels from rear cabin bulkhead.
  - Remove screws from front panel of fuel system components enclosure. Remove panel from structure.

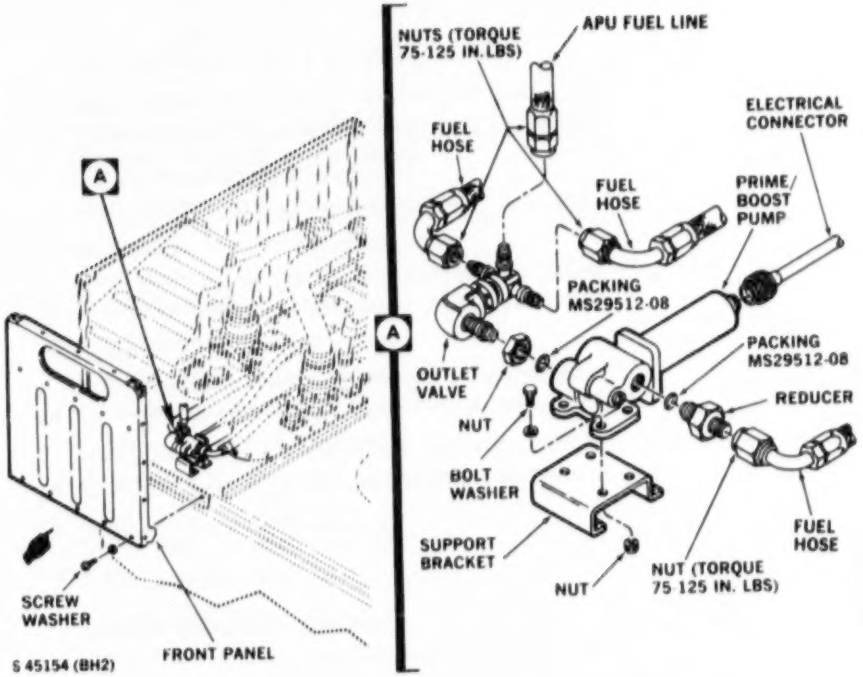

A
SCREW
WASHER
S 45154 (BH2)
FRONT PANEL
A
NUTS (TORQUE
75-125 IN.LBS)
APU FUEL LINE
ELECTRICAL
CONNECTOR
FUEL
HOSE
FUEL
HOSE
PRIME/
BOOST
PUMP
PACKING
MS29512-08
PACKING
MS29512-08
OUTLET
VALVE
REDUCER
NUT
BOLT
WASHER
SUPPORT
BRACKET
FUEL
HOSE
NUT
NUT (TORQUE
75-125 IN. LBS)

Figure 14-5

STEP 5 REPLACE PRIME/BOOST PUMP (CONT)

WARNING

To prevent injury to personnel or damage to equipment, follow normal fire precautions while doing this job. Use suitable container to catch fuel when draining fuel lines.

- Disconnect electrical connector from prime/boost pump.
- Disconnect fuel hose from reducer in prime/boost pump. Plug hose.
- Disconnect APU fuel line and fuel hoses from outlet valve. Plug fuel line and hoses.
- Unbolt prime/boost pump from support bracket.
- Loosen nut holding outlet valve to prime/boost pump. Unthread valve from pump.
- Remove packing from outlet valve port.
- Unthread reducer from prime/boost pump. Remove packings from reducer.

INSTALL

- Turn off all electrical power.
- Lubricate packing MS29512-08 with petrolatum, Fed. Spec VV-P-236. Install packing on reducer.
- Coat threads on reducer with antiseize compound, MIL-A-907. Thread reducer into prime/boost pump.
- Lubricate packing, MS29512-08, with petrolatum, Fed. Spec VV-P-236. Install packing on outlet valve port.
- Coat threads on all outlet valve ports with antiseize compound, MIL-A-907.
- Thread outlet valve into prime/boost pump and tighten nut.
- Bolt prime/boost pump to support bracket.

STEP 5 REPLACE PRIME/BOOST PUMP (CONT)

- Unplug and connect APU fuel line and fuel hoses to outlet valve. **TORQUE NUTS TO 75 - 125 INCH-POUNDS.**
- Coat threads on reducer in prime/boost pump with antiseize compound, MIL-A-907.
- Unplug and connect fuel hose to reducer. **TORQUE NUT TO 75 - 125 INCH-POUNDS.**
- Unplug and connect electrical connector to prime/boost pump.
- Prime fuel system (TASK 12), and APU fuel system (TASK 17).

CAUTION

Do not operate prime/boost pump without fuel at prime/boost pump check valve. Pump failure may occur by running pump dry.

- With electrical power on, operate prime/boost pump to pressurize system.
- Check prime/boost pump for leaks. If leakage is found, make sure all connections are properly tightened, or install new packings.
- Check area to be sure it is free of foreign objects, then enclose fuel system components.
- On UH-60A helicopters, do this:
  - Install front panel with screws.
  - Hook cargo netting in stowage compartment access opening.
  - Install soundproofing blanket.
  - Install troop seats (TM 55-1520-237-23-5).
- On EH-60A helicopters, do this:
  - Install front panel with screws.
  - Install soundproofing panels.

STEP 6 REPLACE PRIME/BOOST PUMP FUEL BREAKAWAY VALVE

DEFUEL

- Pressure defuel fuel cells (TASK 11).
- Purge fuel cell of fumes (TM 55-1500-204-25/1).

REMOVE

- Turn off all electrical power.
- On UH-60A helicopters, do this:
    - Remove troop seats from rear cabin (TM 55-1520-237-23-5).
    - Remove soundproofing from left stowage compartment in cabin midsection.
    - Unhook cargo netting to get into compartment.
- On EH-60A helicopters, remove plenum and evaporator pallet (TM 55-1520-237-23-5).
- Unlock fastener studs securing left panel enclosing fuel system components on top of fuel cells. Remove panel from compartment.

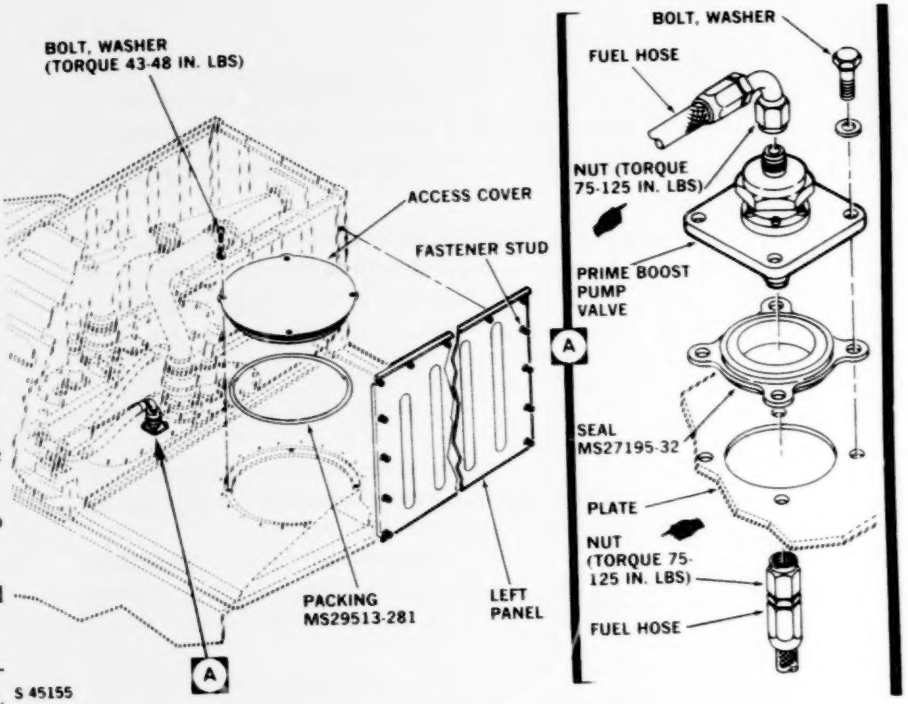

BOLT, WASHER
(TORQUE 43-48 IN. LBS)
ACCESS COVER
FASTENER STUD
PACKING
MS29513-281
LEFT
PANEL
A
S 45155
BOLT, WASHER
FUEL HOSE
NUT (TORQUE
75-125 IN. LBS)
PRIME BOOST
PUMP
VALVE
A
SEAL
MS27195-32
PLATE
NUT
(TORQUE 75-
125 IN. LBS)
FUEL HOSE

Figure 14-6

STEP 6 REPLACE PRIME/BOOST PUMP FUEL BREAKAWAY VALVE (CONT)

WARNING

To prevent injury to personnel or damage to equipment, follow normal fire precautions while doing this job. Use suitable container to catch fuel when draining fuel lines.

- Unbolt and remove fuel cell access cover. Remove packing from cover.
- Reach inside fuel cell and disconnect fuel hose attached to bottom of prime boost pump fuel breakaway valve. Plug hose.
- Disconnect fuel hose from upper part of prime boost pump fuel breakaway valve. Plug hose.
- Unbolt prime/boost pump fuel breakaway valve from plate assembly. Remove seal from plate.

INSTALL

- Turn off all electrical power.
- Coat threads of bolts and threads on prime/boost pump fuel breakaway valve with antiseize compound, MIL-A-907.
- Install seal, MS27195-32, on prime/boost pump fuel breakaway valve. Install short end of valve inside of cell, and bolt valve to plate.
- Unplug and connect fuel hose to upper part of prime/boost pump fuel breakaway valve. **TORQUE NUT TO 75 - 125 INCH-POUNDS.**
- Reach inside fuel cell. Unplug and connect fuel hose to bottom of prime/boost pump fuel breakaway valve. **TORQUE NUT TO 75 - 125 INCH-POUNDS.**
- Coat threads of bolts with antiseize compound, MIL-A-907.

STEP 6 REPLACE PRIME/BOOST PUMP FUEL BREAKAWAY VALVE (CONT)

- Coat packing, MS29513-281, with petrolatum, Fed. Spec VV-P-236. Install packing on fuel cell access cover.
- Bolt fuel cell access cover to fuel cell. **TORQUE BOLTS TO 43 - 48 INCH-POUNDS.**
- Refuel fuel cells (TASK 11).
- With electrical power on, operate prime pump to pressurize system.
- Check system for leaks. If leakage is found, make sure all connections are properly tightened, or install new seal.
- Check area to be sure it is free of all foreign objects.
- Install left panel enclosing fuel system components. Lock fastener studs.
- On UH-60A helicopters, do this:
  - Hook cargo netting in aft section stowage compartment access opening.
  - Install soundproofing.
  - Install troop seats (TM 55-1520-237-23-5).
- On EH-60A helicopters, install evaporator pallet and plenum (TM 55-1520-237-23-5).

Page 14-26.1/14-26.2 deleted.

STEP 9 REPLACE FUEL SELECTOR VALVE (CONT)

INSTALL

- Install seal, MS27195-16, on breakaway tee valve and crossfeed breakaway valve.
- Install breakaway tee valve and crossfeed breakaway valve on fuel selector valve with washers and nuts.

STEP 7 REPLACE CHECK VALVE

NOTE

The following procedures apply to both check valves on left and right side of transmission deck.

REMOVE

- Turn off all electrical power.
- Open oil cooler compartment access doors.

WARNING

To prevent injury to personnel or damage to equipment, follow normal fire precautions while doing this job. Use suitable container to catch fuel when draining fuel lines.

- Disconnect fuel hose from check valve. Plug hose.
- Unthread check valve from breakaway tee valve. Remove packing from tee valve. Plug tee valve.

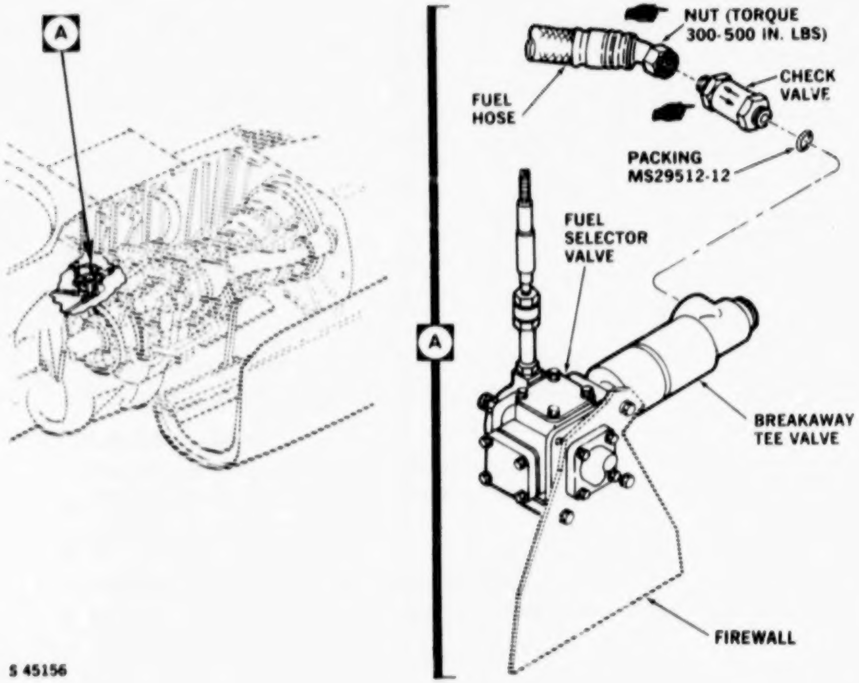

A
S 45156
A
NUT (TORQUE 300-500 IN. LBS)
FUEL HOSE
CHECK VALVE
PACKING MS29512-12
FUEL SELECTOR VALVE
BREAKAWAY TEE VALVE
FIREWALL

Figure 14-7

STEP 7 REPLACE CHECK VALVE (CONT)

INSTALL

- Turn off all electrical power.
- Lubricate packing, MS29512-12, with petrolatum, Fed. Spec VV-P-236.
- Install packing on end of check valve that flow arrow points away from.
- Remove plug from tee valve.
- Thread check valve into breakaway tee valve with flow arrow pointing away from tee valve.
- Unplug and connect fuel hose to check valve. **TORQUE NUT TO 300 - 500 INCH-POUNDS.**
- Prime fuel system (TASK 12).
- Check system for leaks. If leakage is found, make sure all connections are properly tightened, or install new packing.
- Check area to be sure it is free of foreign objects, then close oil cooler compartment access doors.

STEP 8 REPLACE ENGINE COMPARTMENT BREAKAWAY VALVE

NOTE

> The following procedures apply to both left and right side firewall mounted breakaway valves.

REMOVE

- Turn off all electrical power.
- Open engine cowling.
- Disconnect coupling and remove inlet particle separator (IPS) duct from IPS blower (right side only).
- Remove oil cooler compartment left/right side access door from helicopter.

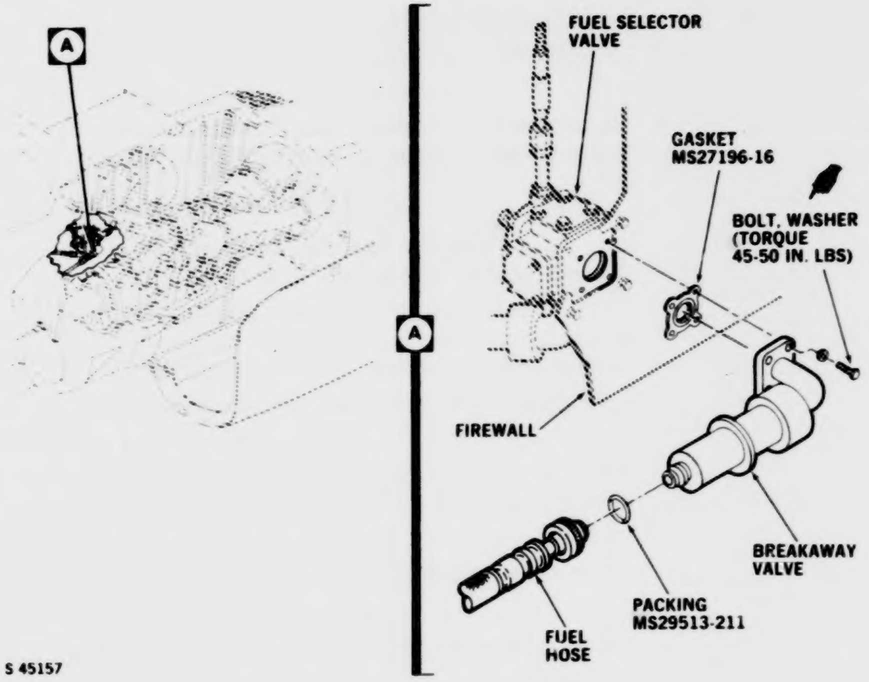

A
FUEL SELECTOR VALVE
GASKET MS27196-16
BOLT, WASHER (TORQUE 45-50 IN. LBS)
A
FIREWALL
BREAKAWAY VALVE
PACKING MS29513-211
FUEL HOSE
S 45157

Figure 14-8

STEP 8 REPLACE ENGINE COMPARTMENT BREAKAWAY VALVE (CONT)

WARNING

To prevent injury to personnel or damage to equipment follow normal fire precautions while doing this job. Use suitable container to catch fuel when draining fuel lines.

- Disconnect fuel hose from breakaway valve. Plug hose.
- Unbolt and remove breakaway valve from fuel selector valve on engine compartment firewall.
- Remove gasket from breakaway valve.
- Cover fuel selector valve opening.

INSTALL

- Turn off all electrical power.
- Remove cover from fuel selector valve opening.
- Install gasket, MS27196-16, on breakaway valve.
- Bolt breakaway valve to fuel selector valve on engine compartment firewall.
- Unplug and connect fuel hose to breakaway valve. **HANDTIGHTEN CONNECTOR.**
- Check for 0.75-inch clearance between fuel hose and fire extinguisher nozzle. If clearance is not correct, do this:
  - Loosen bolts on fuel boost pump swivel flange.
  - Carefully move fuel boost pump elbow until at least 0.75-inch clearance is obtained between fuel hose and fire extinguisher nozzle.
  - **TORQUE BOLTS ON BOOST PUMP SWIVEL FLANGE TO 45 - 50 INCH-POUNDS.**
- Prime fuel system (TASK 12).
- Check system for leaks. If leakage is found, make sure all connections are properly tightened, or install new packing or gasket.
- Check area to be sure it is free of foreign objects, then install oil cooler compartment access door.

STEP 8 REPLACE ENGINE COMPARTMENT BREAKAWAY VALVE (CONT)

- Install inlet particle separator (IPS) duct on IPS blower with coupling. (Right side only.)
- Check area to be sure it is free of foreign objects; then close engine cowling and latch.

STEP 9 REPLACE FUEL SELECTOR VALVE

NOTE

The following procedures apply to both left and right side firewall mounted fuel selector valves.

REMOVE

- Turn off all electrical power.
- Open engine cowling.
- Disconnect coupling and remove inlet particle separator (IPS) duct from IPS blower. (Right side only.)
- Remove oil cooler compartment left/right side access door from helicopter.

WARNING

To prevent injury to personnel or damage to equipment, follow normal fire precautions while doing this job. Use suitable container to catch fuel when draining fuel lines.

- Remove snapring and remove control box and push-pull cable from fuel selector valve.
- Provide 1 quart container to catch fuel when draining fuel lines.
- Disconnect fuel hose from crossfeed breakaway valve. Plug hose. Remove packing from crossfeed breakaway valve.
- Disconnect fuel hoses from check valve and breakaway tee valve. Plug hoses. Remove packing from breakaway tee valve. Cap tee valve and check valve.
- Unbolt engine compartment breakaway valve and gasket from fuel selector valve on engine compartment firewall.
- Unbolt fuel selector valve from firewall and remove from helicopter.
- Remove nuts, breakaway tee valve, crossfeed breakaway valve, and seals from fuel selector valve.

STEP 9 REPLACE FUEL SELECTOR VALVE (CONT)

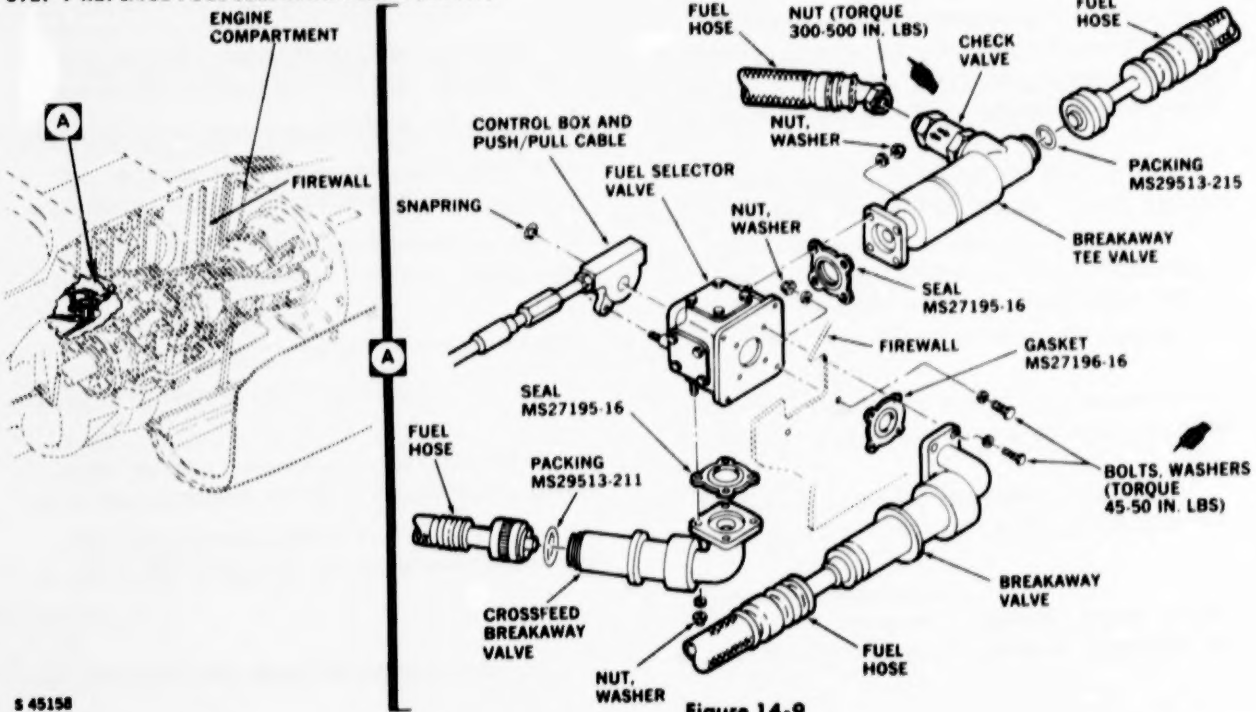

ENGINE COMPARTMENT
A
FIREWALL
A
CONTROL BOX AND PUSH/PULL CABLE
SNAPRING
FUEL SELECTOR VALVE
FUEL HOSE
NUT (TORQUE 300-500 IN. LBS)
CHECK VALVE
FUEL HOSE
NUT, WASHER
PACKING MS29513-215
NUT, WASHER
BREAKAWAY TEE VALVE
SEAL MS27195-16
FIREWALL
GASKET MS27196-16
SEAL MS27195-16
FUEL HOSE
PACKING MS29513-211
BOLTS, WASHERS (TORQUE 45-50 IN. LBS)
BREAKAWAY VALVE
CROSSFEED BREAKAWAY VALVE
FUEL HOSE
NUT, WASHER
S 45158

Figure 14-9

STEP 9 REPLACE FUEL SELECTOR VALVE (CONT)

INSTALL

- Install seal, MS27195-16, on breakaway tee valve and crossfeed breakaway valve.
- Install breakaway tee valve and crossfeed breakaway valve on fuel selector valve with washers and nuts.
- Bolt fuel selector valve to firewall.
- Install gasket, MS27196-16, on engine compartment breakaway valve.
- Bolt engine compartment breakaway valve to fuel selector valve on engine compartment firewall.
- Lubricate packings, MS29513-211 and MS29513-215, with petrolatum, Fed. Spec VV-P-236.
- Uncap check valve and breakaway tee valve.
- Install packing, MS29513-211 on crossfeed valve and packing, MS29513-215, on breakaway tee valve.
- Unplug and connect fuel hoses to breakaway tee valve, and crossfeed breakaway valve. **HAND-TIGHTEN CONNECTORS.**
- Unplug and connect fuel hose to check valve. **TORQUE NUT TO 300 - 500 INCH-POUNDS.**
- Check for 0.75-inch clearance between fuel hose and fire extinguisher nozzle. If clearance is not correct, do this:
  - Loosen bolts on fuel boost pump swivel flange.
  - Carefully move fuel boost pump elbow until at least 0.75-inch clearance is obtained between fuel hose and fire extinguisher nozzle.
  - **TORQUE BOLTS ON BOOST PUMP SWIVEL FLANGE TO 45 - 50 INCH-POUNDS.**
- Line up keyway on shaft of fuel selector valve with key in control box and install control box and push-pull cable on fuel selector valve. Install snapring.

STEP 9 REPLACE FUEL SELECTOR VALVE (CONT)

- Prime fuel system (TASK 12).
- Check system for leaks. If leakage is found, make sure all connections are properly tightened, or install new gasket, packings, and seals.
- Check area to be sure it is free of foreign objects, then install oil cooler compartment left/right side access door.
- Install inlet particle separator (IPS) duct on IPS blower with coupling (right side only).
- Check area to be sure it is free of foreign objects; then close engine cowling and latch.

STEP 10 REPLACE CROSSFEED BREAKAWAY VALVE

NOTE

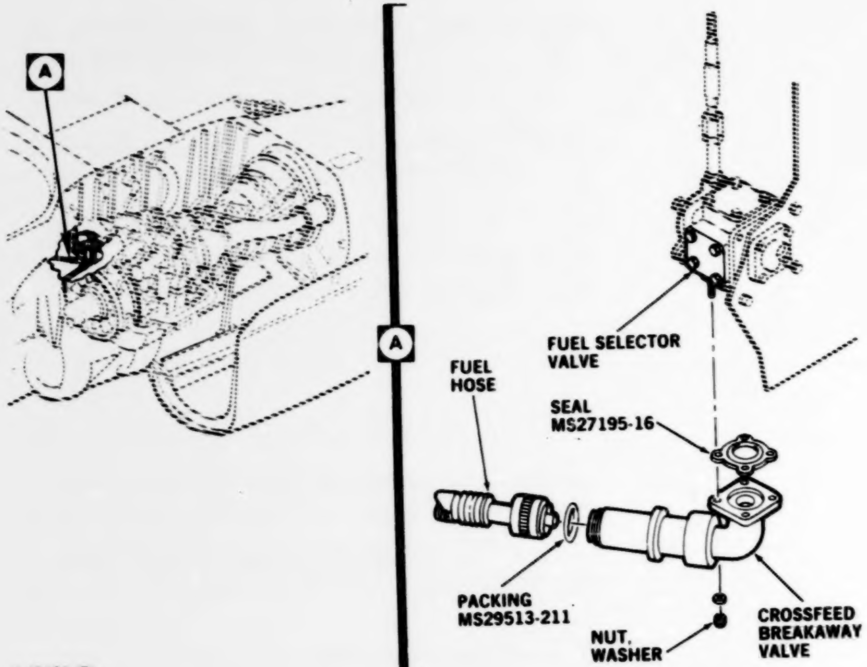
The following procedures apply to both left and right side crossfeed breakaway valves.

REMOVE

- Turn off all electrical power.
- Open engine cowling.
- Remove oil cooler compartment left/right side access door from helicopter.

WARNING

To prevent injury to personnel or damage to equipment, follow normal fire precautions while doing this job. Use suitable container to catch fuel when draining fuel lines.


A
A
FUEL SELECTOR VALVE
FUEL HOSE
SEAL MS27195-16
PACKING MS29513-211
NUT, WASHER
CROSSFEED BREAKAWAY VALVE

S 45159 (B)

Figure 14-10

STEP 10 REPLACE CROSSFEED BREAKAWAY VALVE (CONT)

- Disconnect fuel hose from crossfeed breakaway valve. Plug hose. Remove packing from crossfeed breakaway valve.
- Remove nuts, crossfeed breakaway valve, and seal from fuel selector valve.

INSTALL

- Turn off all electrical power.
- Install seal, MS27195-16, on crossfeed breakaway valve.
- Install crossfeed breakaway valve on fuel selector valve with washers and nuts.
- Lubricate packing, MS29513-211, with petrolatum, Fed. Spec VV-P-236.
- Install packing on crossfeed breakaway valve.
- Unplug and connect fuel hose to crossfeed breakaway valve. **HANDTIGHTEN CONNECTOR.**
- Prime fuel system (TASK 12).
- Check system for leaks. If leakage is found, make sure all connections are properly tightened, or install new packing or seal.
- Check area to be sure it is free of all foreign objects.
- Install oil cooler compartment door.
- Check area to be sure it is free of all foreign objects.
- Close engine cowling and latch.

STEP 11 REPLACE BREAKAWAY TEE VALVE

NOTE

The following procedures apply to both left and right side breakaway tee valves.

REMOVE

- Turn off all electrical power.
- Open engine cowling.
- Remove oil cooler compartment left/right side access door from helicopter.

WARNING

To prevent injury to personnel or damage to equipment, follow normal fire precautions while doing this job. Use suitable container to catch fuel while draining fuel lines.

- Disconnect fuel hoses from check valve and breakaway tee valve. Plug hoses. Remove packing from breakaway tee valve.

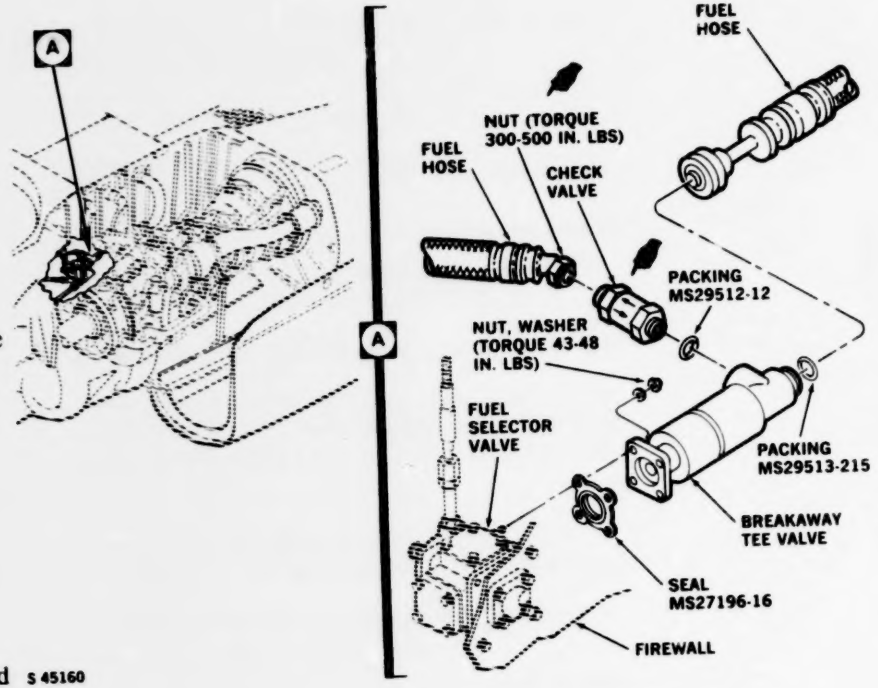

A
A
FUEL HOSE
NUT (TORQUE 300-500 IN. LBS)
FUEL HOSE
CHECK VALVE
PACKING MS29512-12
NUT, WASHER (TORQUE 43-48 IN. LBS)
FUEL SELECTOR VALVE
PACKING MS29513-215
BREAKAWAY TEE VALVE
SEAL MS27196-16
FIREWALL
S 45160

Figure 14-11

STEP 11 REPLACE BREAKAWAY TEE VALVE (CONT)

- Remove nuts, breakaway tee valve, and seal from fuel selector valve.
- Unthread check valve from breakaway tee valve. Remove packing from check valve.

INSTALL

- Turn off all electrical power.
- Lubricate packing, MS29512-12, with petrolatum, Fed. Spec VV-P-236.
- Install packing on end of check valve that flow arrow points away from.
- Thread check valve into breakaway tee valve with flow arrow pointing away from tee valve.
- Install seal, MS27195-16, on breakaway tee valve.
- Install breakaway tee valve to fuel selector valve with washers and nuts. **TORQUE NUTS TO 43 - 48 INCH-POUNDS.**
- Lubricate packing, MS29513-215, with petrolatum, Fed. Spec VV-P-236.
- Install packing on breakaway tee valve.
- Unplug and connect fuel hose to breakaway tee valve.
- Unplug and connect fuel hose to check valve. **TORQUE NUT TO 300 - 500 INCH-POUNDS.**
- Prime fuel system (TASK 12).
- Check system for leaks. If leakage is found, make sure all connections are properly tightened, or install new packings or seal.
- Check area to be sure it is free of foreign objects, then install oil cooler compartment access door.
- Check area to be sure it is free of foreign objects, then close engine cowling and latch.

STEP 12 REPLACE BULKHEAD BREAKAWAY VALVE

NOTE

The following procedures apply to both bulkhead breakaway valves mounted on left and right side of APU compartment deck.

REMOVE

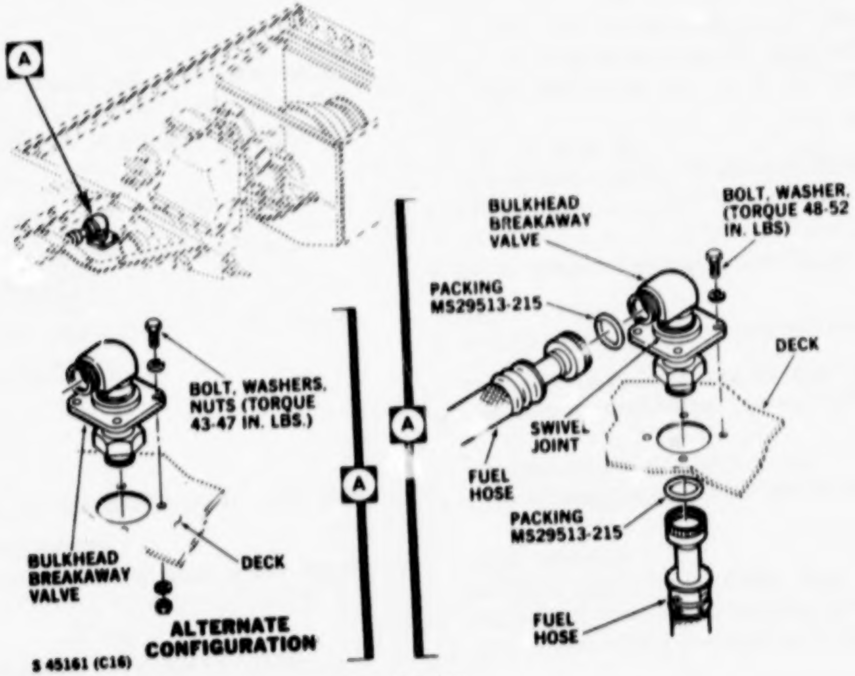
- Turn off all electrical power.
- Open engine cowling.
- Hinge open APU compartment door.
- On UH-60A helicopters, do this:
  - Remove troop seats from rear cabin (TM 55-1520-237-23-5).
  - Remove soundproofing blanket from left/right stowage compartment in cabin midsection.
  - Unhook cargo netting to get into compartment.
- On EH-60A helicopters, do this:
  - Remove right panel on rear cabin bulkhead (TM 55-1520-237-23-5).
  - Remove access panel on right panel enclosing fuel system components.
- Unlock fastener studs holding left/right panel enclosing fuel system components on top of fuel cells. Remove panel from compartment.

WARNING

To prevent injury to personnel or damage to equipment, follow normal fire precautions while doing this job. Use suitable container to catch fuel when draining fuel lines.

- Disconnect fuel hoses from bulkhead breakaway valve. Plug hoses.
- Unbolt bulkhead breakaway valve from APU compartment deck and remove.

STEP 12 REPLACE BULKHEAD BREAKAWAY VALVE (CONT)


A
BULKHEAD BREAKAWAY VALVE
BOLT, WASHER, (TORQUE 48-52 IN. LBS)
PACKING MS29513-215
DECK
SWIVEL JOINT
FUEL HOSE
PACKING MS29513-215
FUEL HOSE
A
A
BOLT, WASHERS, NUTS (TORQUE 43-47 IN. LBS.)
BULKHEAD BREAKAWAY VALVE
DECK
ALTERNATE CONFIGURATION

S 45161 (C16)

Figure 14-12

STEP 12 REPLACE BULKHEAD BREAKAWAY VALVE (CONT)

- Remove sealing compound from valve swivel joint, using plastic scraper.
- Clean area with dry-cleaning solvent, Fed. Spec P-D-680, Type II.

INSTALL

- Turn off all electrical power.
- Lubricate packings, MS29513-215, with petrolatum, Fed. Spec VV-P-236.
- Install packings on bulkhead breakaway valve.
- Coat threads of bolts with antiseize compound, MIL-A-907.
- If nutplates are installed, bolt bulkhead breakaway valve to APU compartment deck with bolts and washers. **TORQUE BOLTS TO 48 - 52 INCH-POUNDS.**
- If nutplates are not installed, bolt bulkhead breakaway valve to APU compartment deck with bolts, washers, and nuts. **TORQUE NUTS TO 43 - 47 INCH-POUNDS.**
- Coat threads on bulkhead breakaway valve with antiseize compound, MIL-A-907.
- Unplug and connect fuel hoses to bulkhead breakaway valve. **HANDTIGHTEN CONNECTORS.**
- Seal swivel joint with sealing compound, MIL-S-8802.
- Prime fuel system (TASK 12).
- Check system for leaks. If leakage is found, make sure all connections are properly tightened, or install new packings.
- Check area to be sure it is free from foreign objects, then install left/right panel enclosing fuel system components. Lock fastener studs.

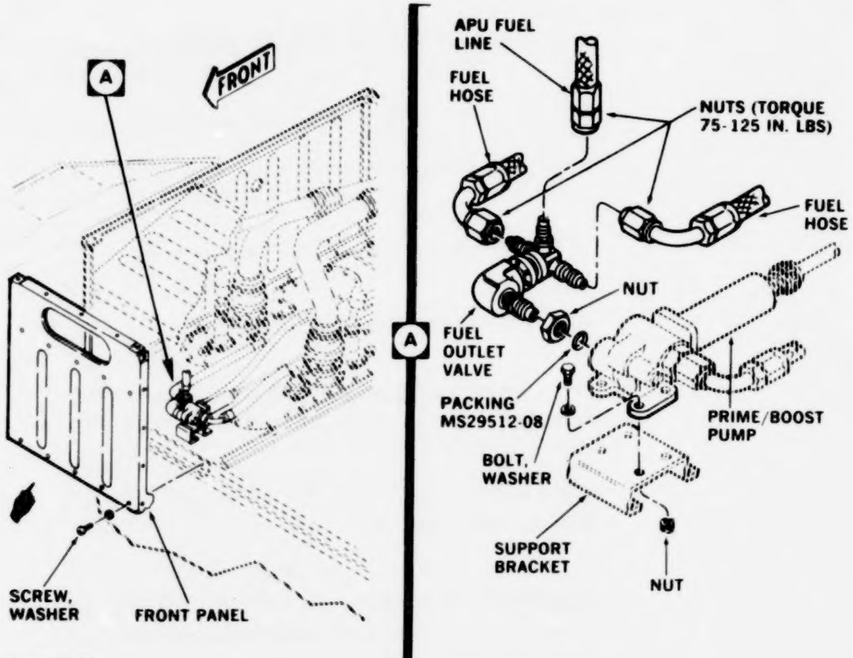
STEP 12 REPLACE BULKHEAD BREAKAWAY VALVE (CONT)

- On UH-60A helicopters, do this:
  - Hook cargo netting in stowage compartment access opening.
  - Install soundproofing blanket.
  - Install troop seats (TM 55-1520-237-23-5).
- On EH-60A helicopters, do this:
  - Install access panel on right panel enclosing fuel system components.
  - Install right panel on rear cabin bulkhead (TM 55-1520-237-23-5).
- Check area to be sure it is free from foreign objects, then close and latch APU compartment door.
- Check area to be sure it is free from foreign objects; then close engine cowling and latch.

STEP 13 REPLACE PRIME/BOOST PUMP FUEL OUTLET VALVE

REMOVE

- Turn off all electrical power.
- On UH-60A helicopters, do this:
  - Remove troop seats from rear cabin (TM 55-1520-237-23-5).
  - Remove soundproofing blanket from left/right stowage compartment and center structure in cabin midsection.
  - Unhook cargo netting to get into compartment.
  - Remove screws from front panel of fuel system components enclosure.
  - Remove panel from structure.
- On EH-60A helicopters, do this:
  - Remove soundproofing panels from rear cabin bulkhead.
  - Remove screws from front panel of fuel system components enclosure. Remove panel from structure.


A
FRONT
SCREW, WASHER
FRONT PANEL
APU FUEL LINE
FUEL HOSE
NUTS (TORQUE 75-125 IN. LBS)
FUEL HOSE
NUT
A
FUEL OUTLET VALVE
PACKING MS29512-08
BOLT, WASHER
PRIME/BOOST PUMP
SUPPORT BRACKET
NUT

S 45162 (BH2)

Figure 14-13

STEP 13 REPLACE PRIME/BOOST PUMP FUEL OUTLET VALVE (CONT)

WARNING

To prevent injury to personnel or damage to equipment, follow normal fire precautions while doing this job. Use suitable container to catch fuel when draining fuel lines.

- Disconnect APU fuel line and fuel hoses from fuel outlet valve. Plug fuel line and hoses.
- Unbolt prime/boost pump from support bracket.
- Loosen nut holding fuel outlet valve to prime boost pump.
- Lift up prime/boost pump and unthread fuel outlet valve from pump.
- Remove packing and nut from fuel outlet valve.

INSTALL

- Install nut on fuel outlet valve.
- Lubricate packing, MS29512-08, with petrolatum, Fed. Spec VV-P-236.
- Install packing on fuel outlet valve.
- Coat threads on fuel outlet valve ports with anti-seize compound, MIL-A-907.
- Lift up prime/boost pump and thread fuel outlet valve into pump.
- Tighten nut to fasten fuel outlet valve to prime boost pump.
- Bolt prime/boost pump to support bracket.
- Unplug and connect APU fuel line and fuel hoses to fuel outlet valve. **TORQUE NUTS TO 75 - 125 INCH-POUNDS**.
- Prime fuel system (TASK 12).
- Check system for leaks. If leakage is found, make sure all connections are properly tightened, or install new packings.
- Check area to be sure it is free of foreign objects, then enclose fuel system components.

STEP 13 REPLACE PRIME/BOOST PUMP FUEL OUTLET VALVE (CONT)

- On UH-60A helicopters, do this:
  - Install front panel with screws.
  - Hook cargo netting in stowage compartment access opening.
  - Install soundproofing blanket.
  - Install troop seats (TM 55-1520-237-23-5).
- On EH-60A helicopters, do this:
  - Install front panel with screws.
  - Install soundproofing panels.

STEP 14 REPLACE FUEL SYSTEM DRAIN/VENT LINES, LOWER FUSELAGE

NOTE

The following procedures apply to both No. 1 and No. 2 engine fuel vent drain line replacements.

REMOVE

CAUTION

Do not use tubes as hand supports or foot rests.

- Turn off all electric power.
- Unlatch and hinge open engine access compartment door, as required.
- Remove soundproofing blanket from left/right stowage compartments and center structure in cabin midsection.
- Note location of all clamps and brackets.

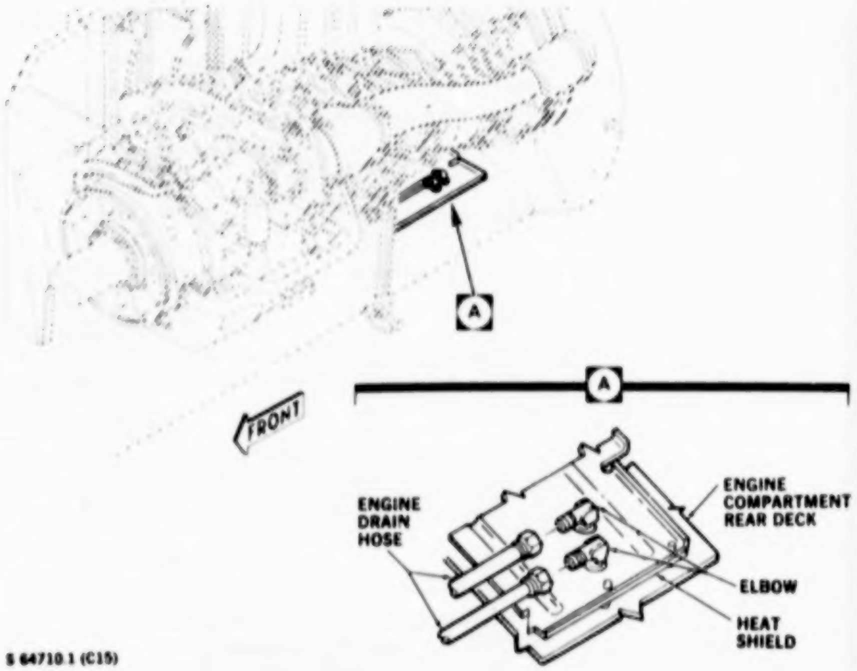
CAUTION

During bolt removal process, do not use force or pressure upon tube or cause tube to bend or distort.

- Remove, from tube or tubes to be removed, all screws securing tube clamps to brackets, other clamps or compartment heat shield (Figure 14-14, Detail A).
- Once clamps are loosened from all tubes to be removed, nuts at manifold hose and tube ends may be unfastened.
- To remove manifold drain tube, do this (Figure 14-14, Detail B):
  - Disconnect manifold hose from elbow on engine compartment rear deck (Detail A) and from elbow (Detail B).
  - Slide nuts from threaded fittings and gently flex manifold hose over cone of connector elbow fitting or fittings. Manifold hose will now be free.

STEP 14 REPLACE FUEL SYSTEM DRAIN/VENT LINES, LOWER FUSELAGE (CONT)

  - Remove hexnut, flat washer and sealing washer, from deck elbow. Discard sealing washer. Remove deck elbow.
  - Remove hexnut and flat washer from elbow. Unthread elbow from manifold drain tube.
  - Disconnect manifold drain tube from drain tee fitting.
- To remove combustion drain tube, do this (Detail B):
  - Disconnect tube nut from deck elbow. Remove hexnut, flat washers, and sealing washer, from elbow. Discard sealing washer. Remove deck elbow.
  - Slide tube free from grommet located in mounting plate (Figure 14-14, Detail C).
- To remove compartment drain tube, do this (Figure 14-14, Detail C):
  - Disconnect tube from union fitting at vent drain and from tee reducer.



S 64710.1 (C15)

Figure 4-14 (Sheet 1 of 3)

STEP 14 REPLACE FUEL SYSTEM DRAIN/VENT LINES, LOWER FUSELAGE (CONT)

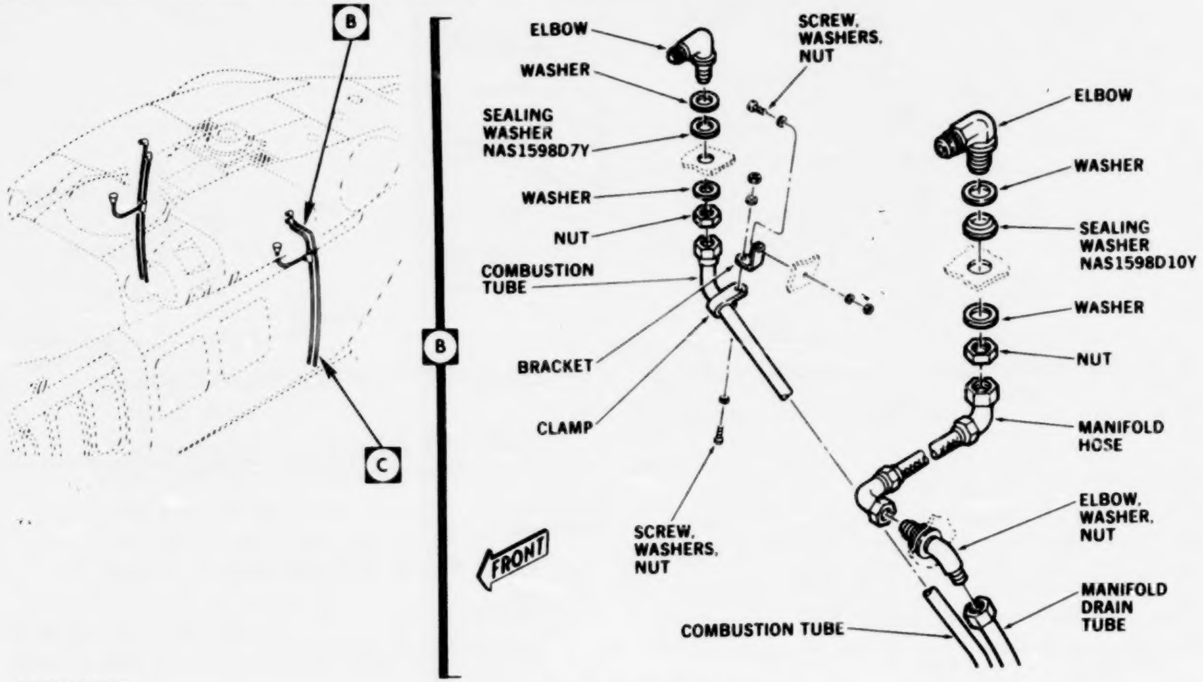

B
C
B
ELBOW
WASHER
SEALING WASHER NAS1598D7Y
WASHER
NUT
COMBUSTION TUBE
BRACKET
CLAMP
SCREW, WASHERS, NUT
SCREW, WASHERS, NUT
FRONT
ELBOW
WASHER
SEALING WASHER NAS1598D10Y
WASHER
NUT
MANIFOLD HOSE
ELBOW, WASHER, NUT
MANIFOLD DRAIN TUBE
COMBUSTION TUBE
S 64710.2 (C15)

Figure 14-14 (Sheet 2 of 3)

STEP 14 REPLACE FUEL SYSTEM DRAIN/VENT LINES, LOWER FUSELAGE (CONT)

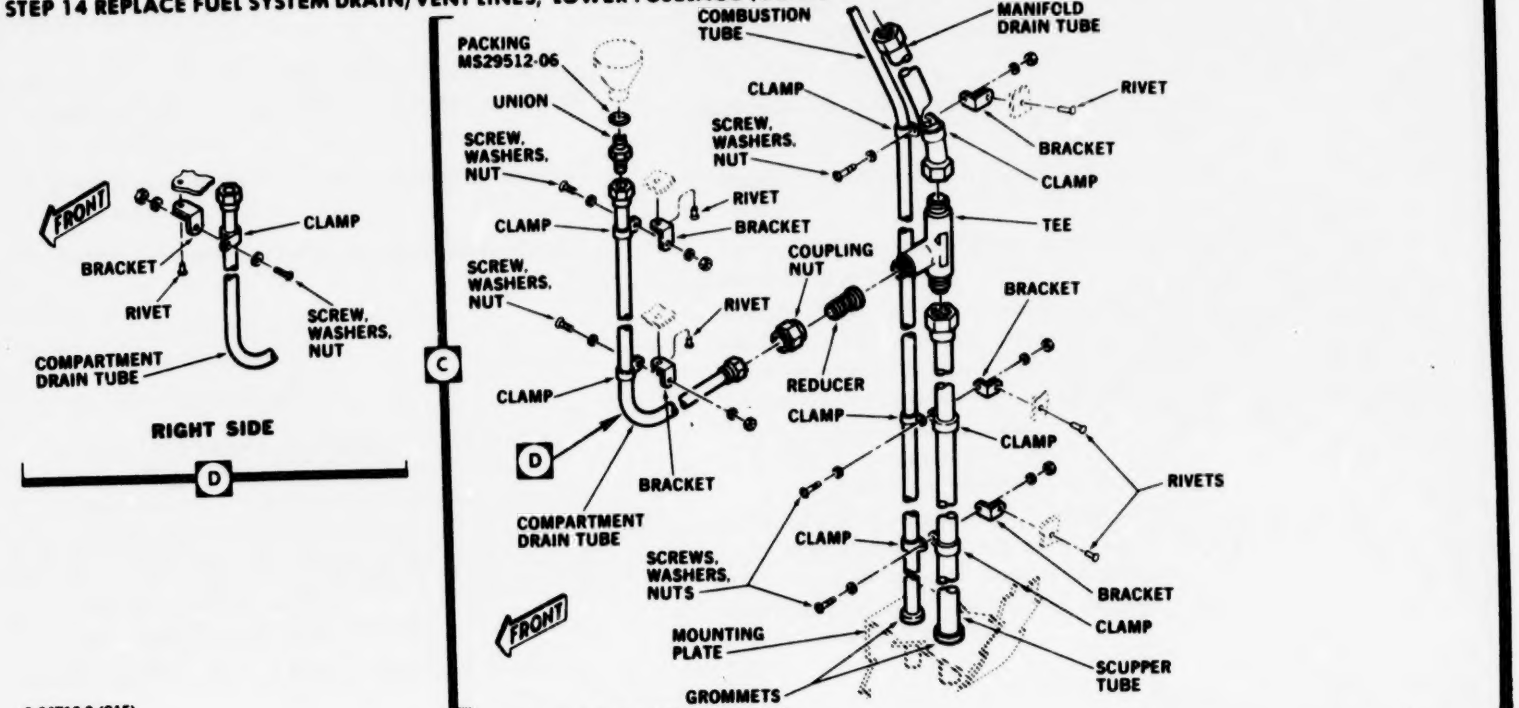
- Slide nuts from threaded fittings and gently flex tube over cones of connector fittings. Tube will now be free.
- Remove union fitting with preformed packing, from vent drain. Discard packing.
- Remove coupling nut and reducer fitting from tee.
- Unthread tee from scupper tube. Slide tube free from grommet in mounting plate (Detail C).

- Plug or cap electrical connectors, open ports, and tubes, hoses, elbows, and connector fittings.

INSPECT

- Inspect coupling nut for cracks.
- Check threads of nuts and connector fittings. Replace if damaged.

STEP 14 REPLACE FUEL SYSTEM DRAIN/VENT LINES, LOWER FUSELAGE (CONT)


FRONT
BRACKET
RIVET
CLAMP
SCREW, WASHERS, NUT
COMPARTMENT DRAIN TUBE
RIGHT SIDE
D
C
PACKING MS29512-06
UNION
SCREW, WASHERS, NUT
CLAMP
SCREW, WASHERS, NUT
CLAMP
D
COMPARTMENT DRAIN TUBE
BRACKET
RIVET
BRACKET
RIVET
COUPLING NUT
REDUCER
COMBUSTION TUBE
CLAMP
SCREW, WASHERS, NUT
MANIFOLD DRAIN TUBE
RIVET
BRACKET
CLAMP
TEE
BRACKET
CLAMP
CLAMP
RIVETS
CLAMP
SCREWS, WASHERS, NUTS
BRACKET
CLAMP
MOUNTING PLATE
GROMMETS
SCUPPER TUBE
FRONT

S 64710.3 (C15)

Figure 14-14 (Sheet 3 of 3)

STEP 14 REPLACE FUEL SYSTEM DRAIN/VENT LINES, LOWER FUSELAGE (CONT)

- Inspect tubing for dents and distortion. Replace tubing if dents or distortion in tubes are over 10% of tube diameter.
- Inspect grommets for cracks and wear. Replace if necessary.
- Inspect brackets for cracks, bending, and security.

INSTALL

- Turn off electric power.

NOTE

Install and support all tubing so that chafing will not happen. All fuel lines must have at least a 1/2-inch clearance from all engine control cables.

- Blow all lines clear with filtered, dry compressed air before installation.
- Coat male threads with anti-seize compound, MIL-A-907.
- Lubricate preformed packing, MS25912-06 and sealing washers, NAS1598D7Y and NAS 1598D10Y, with petrolatum, Fed. Spec VV-P-236.
- Install packing, MS25912-06, in groove of union of compartment tube.
- To install manifold drain tube, do this (Figure 14-14, Detail B):
  - Uncap and unplug elbows, manifold hoses, and tubing as required.
  - Install elbow with flat washer and sealing washer, NAS1598D10Y, in engine compartment rear deck (Figure 14-14, Detail A). Position elbow forward and tighten elbow securely.

CAUTION

Make sure drain manifold tube does not chafe against engine main frame, swirl frame or scroll case. If there is chafing, loosen nuts on hoses and tubing, reposition each and retighten nuts.

STEP 14 REPLACE FUEL SYSTEM DRAIN/VENT LINES, LOWER FUSELAGE (CONT)

NOTE

All sealing washers, NAS1598D7Y and NAS1598D10Y, and preformed packing, MS29512-06, must be new and lubricated with petrolatum, Fed. Spec VV-P-236.

- Add washer and hexnut on elbow at rear of heat shield. **TORQUE TO 380 - 405 INCH-POUNDS.**
- Connect manifold hose to elbow. **TORQUE HOSE NUT TO 175 - 300 INCH-POUNDS.**
- Insert elbow through opening in heat shield. Install washer and hexnut on elbow. **TORQUE NUT TO 190 - 210 INCH-POUNDS.**
- Connect manifold hose to elbow. **TORQUE HOSE NUT TO 75 - 125 INCH-POUNDS.**
- Connect manifold drain tube elbow to deck elbow. **TORQUE TUBE NUTS TO 75 - 125 INCH-POUNDS.**
- Connect manifold drain tube to tee. **TORQUE TUBE NUT TO 75 - 125 INCH-POUNDS.**

NOTE

When installing compartment drain tube clamps, refer to Figure 14-14, Detail C for correct location.

- Secure manifold drain tube with clamp. Install clamp on bracket with screw, washer, and nut to secure tube.
- Install clamp on manifold drain tube. Do not secure clamp now.
- Insert scupper tube into grommet on mounting plate (Detail C). Connect tube to tee. **TORQUE NUT TO 100 - 175 INCH-POUNDS.**
- Install clamp on scupper tube. Do not secure clamp now.
- Secure scupper tube with clamp on bracket with screw, washer and nut.

- To install combustion drain tube, do this (Figure 14-14, Detail C):
  - Install packing, MS29512-06, in groove of union, Thread union into compartment drain tube. **TORQUE UNION TO 175 - 300 INCH-POUNDS.**

STEP 14 REPLACE FUEL SYSTEM DRAIN/VENT LINES, LOWER FUSELAGE (CONT)

- Install reducer and coupling nut on tee fitting. **TORQUE COUPLING NUT TO 200 - 350 INCH-POUNDS.**
- Install compartment drain tube on coupling nut. **TORQUE TUBE NUT TO 175 - 300 INCH-POUNDS.**

NOTE

When installing manifold drain tube clamp, refer to Detail D for correct location.

- Secure compartment drain tube with clamps. Install clamps on brackets with screws, washers, and nuts.

- To install compartment drain tube, do this (Figure 14-14, Detail C):
  - Install elbow on engine compartment rear deck (Detail A). Position elbow forward and tighten it securely.
  - Install flat washer and sealing washer, NAS 1598D7Y, on elbow forward of heat shield.
  - Install flat washer and hexnut on elbow at rear of heat shield. **TORQUE NUT TO 380 - 405 INCH-POUNDS.**
  - Insert combustion drain tube in grommet on mounting plate (Detail C). Connect drain tube to elbow. **TORQUE TUBE NUT TO 40 - 60 INCH-POUNDS.**
  - Install and connect clamps on combustion drain tube with screws, washers, and nuts (Figure 14-14, Detail B).

CAUTION

Do not pressurize fuel tanks. Cap vent lines at inlet to tanks.

- Pressure-test fuel system drain lines at 15 psig for 5 minutes. NO LEAKAGE ALLOWED. If leakage is found, make sure all connections are properly tightened, or install new packings and sealing washers.

STEP 14 REPLACE FUEL SYSTEM DRAIN/VENT LINES, LOWER FUSELAGE (CONT)

- Install soundproofing blanket in left and right stowage compartments and cabin.
- Close and latch engine access compartment door.

CAUTION

Do not use tubes as hand supports or foot rests.

REMOVE

NOTE

The following procedures apply to both No. 1 and No. 2 fuel cell vent lines.

- Turn off all electrical power.
- On UH-60A helicopters, do this:
  - Remove troop seats from rear cabin (TM 55-1520-237-23-5).
  - Remove soundproofing blanket from left/right stowage compartment and center structure in cabin midsection.
  - Unhook cargo netting to get into compartment.
- On EH-60A helicopters, do this:
  - Remove soundproofing panels from rear cabin bulkhead.
  - For access to No. 1 fuel cell vent line, remove evaporator pallet (TM 55-1520-237-23-5).
  - For access to No. 2 fuel cell vent line, remove condenser pallet and loosen supply ducting (TM 55-1520-237-23-5).
- Remove screws fastening top panel on fuel cell compartment. Remove panel from structure.
- Unlock studs fastening left/right panel(s) to fuel cell compartment. Remove panel(s) from structure.
- Remove screws fastening front panel to fuel cell compartment. Remove panel from structure.

STEP 14 REPLACE FUEL SYSTEM DRAIN/VENT LINES, LOWER FUSELAGE (CONT)

WARNING

To prevent injury to personnel or damage to equipment, follow normal fire precautions while doing this job. Use suitable container to catch fuel when draining fuel lines.

- On fuel vent tube:
  - Remove screws and bonding jumpers from vent tube Y and from main fuel hoses (Figure 14-15, Detail A).

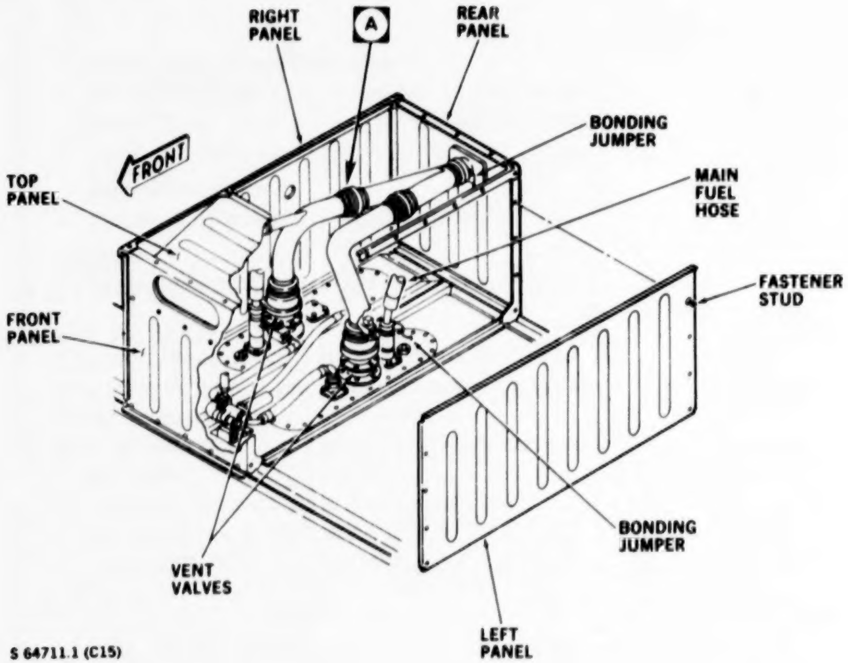
STEP 14 REPLACE FUEL SYSTEM DRAIN/VENT LINES, LOWER FUSELAGE (CONT)

- On No. 1 fuel vent tube only, remove screw and bonding jumper connected to clamp on vent tube. Remove screw and bonding connector from clamp and top panel structure (Detail A).

NOTE

On No. 2 fuel cell only, remove bonding jumper and clamps from fuel vent tube and vent tube Y.

- Remove, from vent tube or tubes to be removed, all screws, washers, and nuts securing tube clamps.
- Disconnect front vent tubes from vent valves and vent tube Y (Detail A).
- Disconnect vent tube Y from rear panel. Remove packings from vent tubes.


RIGHT PANEL
A
REAR PANEL
BONDING JUMPER
MAIN FUEL HOSE
FRONT
TOP PANEL
FASTENER STUD
FRONT PANEL
BONDING JUMPER
VENT VALVES
LEFT PANEL

S 64711.1 (C15)

Figure 14-15 (Sheet 1 of 2)

STEP 14 REPLACE FUEL SYSTEM DRAIN/VENT LINES, LOWER FUSELAGE (CONT)

CAUTION

To avoid damaging UHF antenna in transition section tub, protect it with a temporary protective cover before entering tail cone area.

- – Disconnect rear vent tube from rear panel and transition section bottom. Remove packings from rear vent tube.
- Plug or cap electrical connectors, open ports and tubes, hoses, and connector fittings (elbows).

INSPECT

- Inspect tubing for dents and distortion. Replace tubing if dents or distortion are over 10% of tube diameter.
- Inspect clamps for distortion and security.

INSTALL

- Turn off electric power.

NOTE

Install and support all tubing to avoid chafing. All vent tubes must have at least 1/2-inch clearance from all engine control cables.

- Blow all lines clear with filtered, dry compressed air before installation.
- Lubricate packings, MS29513-215 and MS29513-230 and mounting surfaces with petrolatum, Fed. Spec VV-P-236.
- To install fuel vent tubes, do this (Figure 14-15, Detail A):
  - – Uncap and unplug elbows, hose and vent tubing, as required.
  - – Lubricate packings, MS29513-230 with petrolatum, Fed. Spec VV-P-236. Install packings on ends of front (No. 1 and No. 2) vent tubes and on ends of rear vent tube .

STEP 14 REPLACE FUEL SYSTEM DRAIN/VENT LINES, LOWER FUSELAGE (CONT)

- Connect vent tube Y to rear panel and elbow. Secure tubing with clamp, screw, washer, and nut (Detail A).
- Connect bonding jumper from vent tube elbow to top panel structure with screw.
- Install packings, MS29513-215, on No. 1 and No. 2 vent tube ends.
- Connect front vent tubes (No. 1 and No. 2) to respective vent valves and vent tube Y. Secure tubings with clamps, screws, washers, and nuts.
- Connect bonding jumpers from No. 1 and No. 2 vent tube clamps to vent tube hoses with screws.
- Connect rear vent tube to rear panel elbow and to transition section bottom with clamps, screws, washers, and nuts.

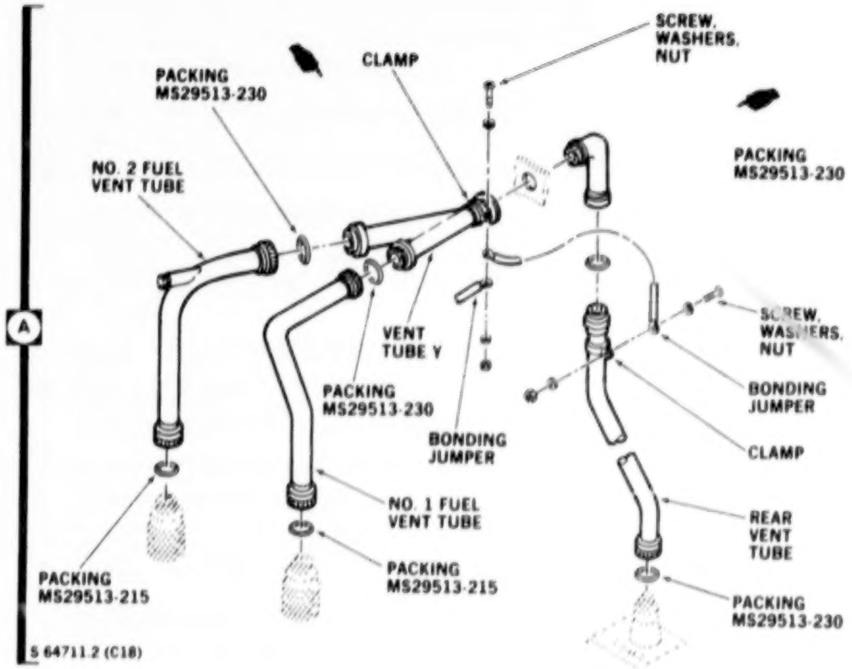

A
SCREW, WASHERS, NUT
CLAMP
PACKING MS29513-230
NO. 2 FUEL VENT TUBE
PACKING MS29513-230
VENT TUBE Y
SCREW, WASHERS, NUT
PACKING MS29513-230
BONDING JUMPER
BONDING JUMPER
CLAMP
NO. 1 FUEL VENT TUBE
REAR VENT TUBE
PACKING MS29513-215
PACKING MS29513-215
PACKING MS29513-230
5 64711.2 (C18)

Figure 14-15 (Sheet 2 of 2)

STEP 14 REPLACE FUEL SYSTEM DRAIN/VENT LINES, LOWER FUSELAGE (CONT)

  - Connect bonding jumper from rear vent tube clamp to rear panel with screws, washers, and nuts.

CAUTION

Do not pressurize fuel tanks. Cap vent lines at inlet to tanks.

- Pressure-test fuel system drain lines at 15 psig for 5 minutes. NO LEAKAGE ALLOWED. If leakage is found, make sure all connections are properly tightened, or install new packings and sealing washers.
- Check area to be sure it is free of foreign objects, then enclose fuel system components.
- Install front panel with screws.
- Install left/right panels enclosing fuel system compartments. Lock fastener studs.
- On UH-60A helicopters, do this:
  - Hook cargo netting in stowage compartment access opening.
  - Install soundproofing blanket.
  - Install troop seats (TM 55-1520-237-23-5).
- On EH-60A helicopters, do this:
  - Replace evaporator pallet (TM 55-1520-237-23-5).
  - Replace condenser pallet (TM 55-1520-237-23-5).
  - Install soundproofing panels.
- Close and latch engine access compartment door.

STEP 15 REPLACE FIXED ESSS FUEL SYSTEM BLEED-AIR LINES AND QUICK-DISCONNECTS

REMOVE

NOTE

The following procedures apply to helicopters serial Nos 82-23748 and subsequent.

- Turn off all electric power.
- Open main rotor pylon sliding fairing.
- Remove clamps from bleed-air lines.

NOTE

Keep attaching hardware with tubing for future use.

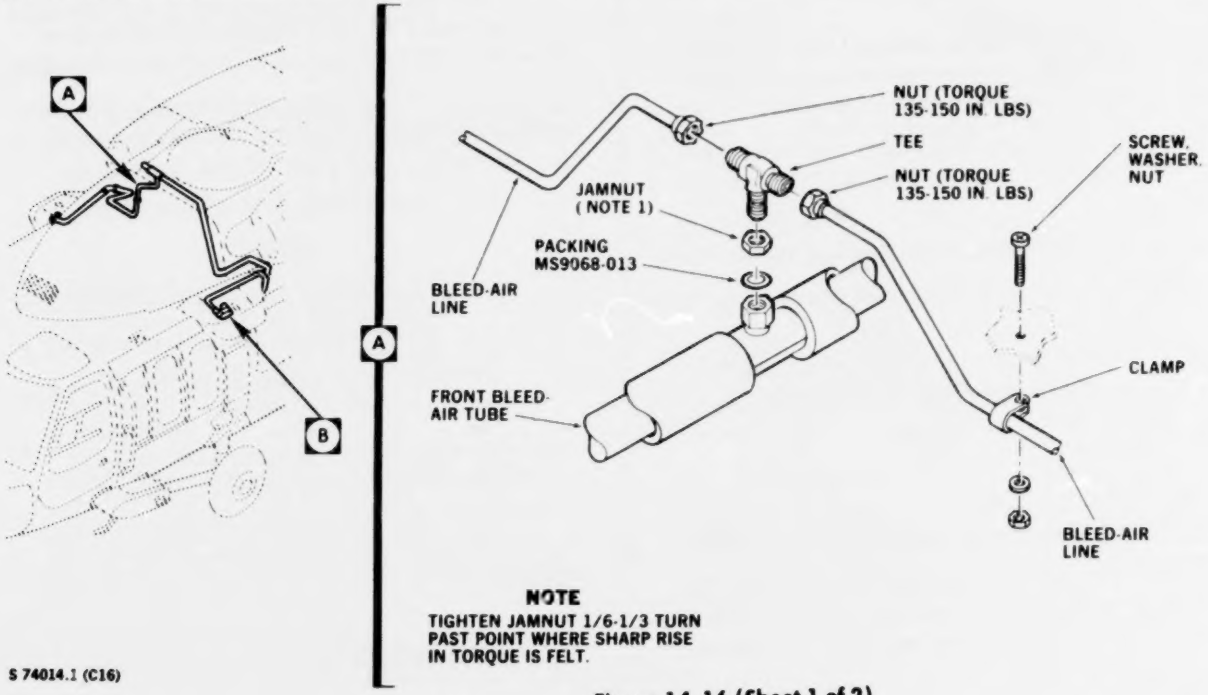
- Disconnect bleed-air lines from tee in front bleed-air tube (Figure 14-16, Sheet 1).
- Remove tee from front bleed-air tube. Remove packing and jamnut from tee. Cap or plug tee.
- Disconnect bleed-air lines from elbows in airframe at station 336 and remove lines (Figure 14-16, Sheet 2). Cap or plug lines.
- Hinge open ESSS platform rear fairing (TM 55-1520-237-2-5)

NOTE

The following steps apply to both left and right bleed-air lines.

- Remove clamps from bleed-air lines.
- Disconnect bleed-air line from elbow in airframe at station 336.
- Disconnect bleed-air line from quick-disconnect and remove line. Cap or plug line.
- Uncap quick-disconnect. Remove jamnut and washer from quick-disconnect (Figure 14-16, Sheet 2), and remove quick-disconnect from bracket.

STEP 15 REPLACE FIXED ESSS FUEL SYSTEM BLEED-AIR LINES AND QUICK-DISCONNECTS (CONT)


A
B
A
NUT (TORQUE 135-150 IN. LBS)
TEE
NUT (TORQUE 135-150 IN. LBS)
SCREW, WASHER, NUT
JAMNUT (NOTE 1)
PACKING MS9068-013
BLEED-AIR LINE
FRONT BLEED-AIR TUBE
CLAMP
BLEED-AIR LINE
S 74014.1 (C16)

NOTE

TIGHTEN JAMNUT 1/6-1/3 TURN PAST POINT WHERE SHARP RISE IN TORQUE IS FELT.

Figure 14-16 (Sheet 1 of 2)

STEP 15 REPLACE FIXED ESSS FUEL SYSTEM BLEED-AIR LINES AND QUICK-DISCONNECTS (CONT)

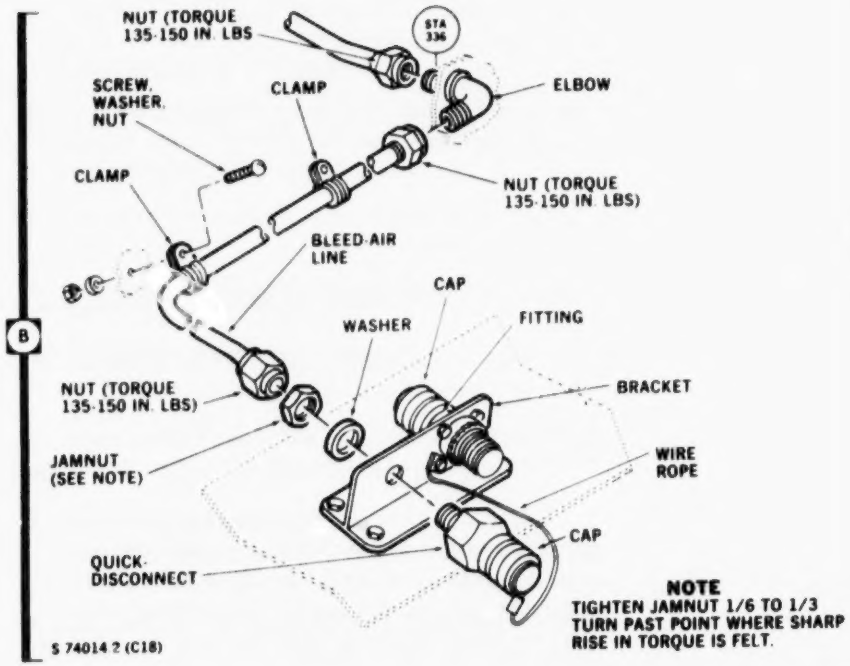
INSTALL

- Install quick-disconnect in bracket, using jamnut and washer (Figure 14-16, Sheet 2). **TIGHTEN JAMNUT 1/6 to 1/3 TURN PAST POINT WHERE SHARP RISE IN TORQUE IS FELT.**

NOTE

Maximum gap allowed is 0.30 between interface of cap and plate. If gap exceeds this limit, check threads on cap and quick-disconnect. If threads are damaged replace cap or quick-disconnect.

- Install cap on quick-disconnect with wire-rope ends properly secured (Figure 14-16, Sheet 2).
- Coat threads of quick-disconnect, installed in bracket, with antiseize compound, MIL-A-907, and connect bleed-air line. **TORQUE NUT ON LINE TO 135 - 150 INCH-POUNDS.**
- Connect bleed-air line to elbow in airframe at station 336. **TORQUE NUT ON LINE TO 135 - 150 INCH-POUNDS.**


NUT (TORQUE 135-150 IN. LBS
STA 336
SCREW, WASHER, NUT
CLAMP
ELBOW
CLAMP
NUT (TORQUE 135-150 IN. LBS)
BLEED-AIR LINE
B
CAP
WASHER
FITTING
NUT (TORQUE 135-150 IN. LBS)
BRACKET
JAMNUT (SEE NOTE)
WIRE ROPE
CAP
QUICK-DISCONNECT
S 74014 2 (C18)

NOTE
TIGHTEN JAMNUT 1/6 TO 1/3 TURN PAST POINT WHERE SHARP RISE IN TORQUE IS FELT.

Figure 14-16 (Sheet 2 of 2)

STEP 15 REPLACE FIXED ESSS FUEL SYSTEM BLEED-AIR LINES AND QUICK-DISCONNECTS (CONT)

- Install clamps on bleed-air line and attach line and clamps to airframe, using screws, washers, and nuts.
- Close and secure platform rear fairing (TM 55-1520-237-23-5).
- Lubricate packing, MS9068-013, with petrolatum, Fed. Spec VV-P-236. Install jamnut and packing on tee.
- Coat threads of tee with anti-seize compound, MIL-A-907, and install in front bleed-air tube.
- Connect bleed-air lines to elbows in airframe.
- Line up and connect bleed-air lines to tee. **TIGHTEN JAMNUT ON TEE 1/6 TO 1/3 TURN PAST POINT WHERE SHARP RISE IN TORQUE IS FELT. TORQUE NUTS ON LINES AT ELBOWS AND TEE TO 135 - 150 INCH-POUNDS.**
- Install clamps on bleed-air lines and attach lines and clamps to airframe with screws, washers, and nuts.
- Check area for foreign material.
- Close main rotor pylon sliding cover.

STEP 16 REPLACE ESSS FUEL LINES AND QUICK-DISCONNECTS STATION 312 TO STATION 398

REMOVE

- Remove cabin overhead soundproofing (TM 55-1520-237-23-5).

CAUTION

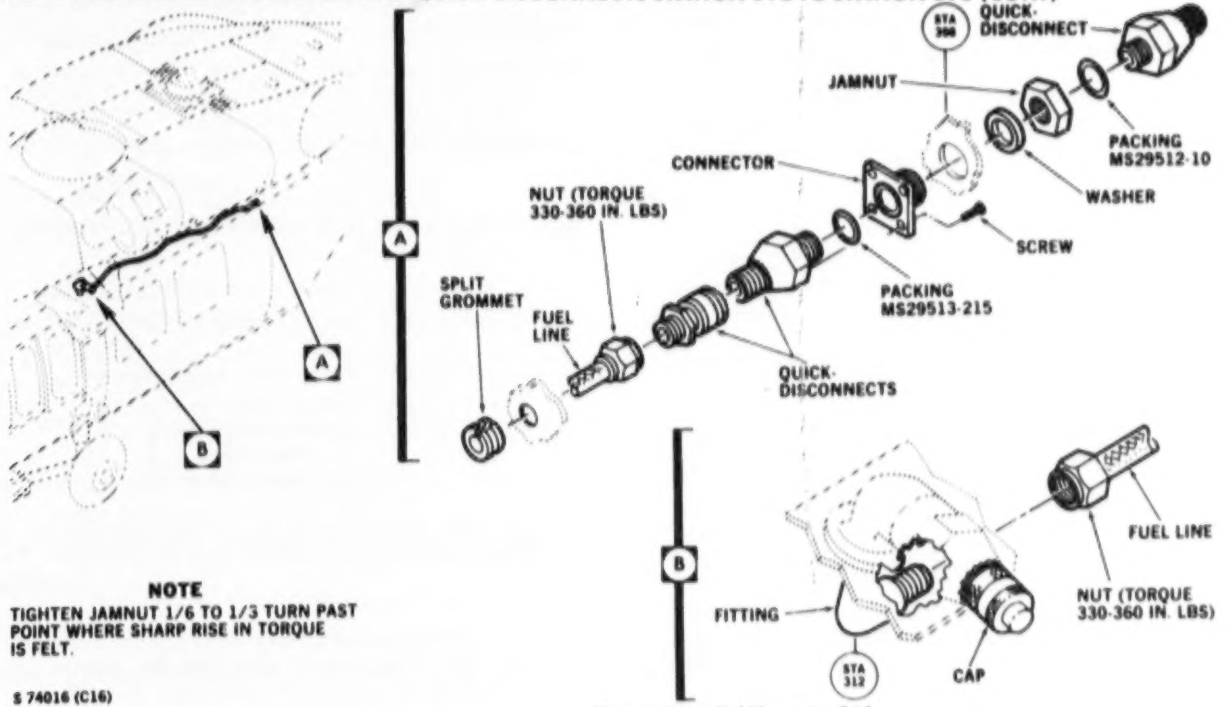
To prevent fuel spillage, use a suitable container to catch any remaining fuel in lines.

- Disconnect quick-disconnects on fuel lines at station 398 (Figure 14-17, Sheet 1, Detail A).
- Disconnect fuel line from fitting at station 312 (Figure 14-17, Sheet, 1, Detail B).
- Remove split grommets from airframe and fuel line.
- Remove fuel line from clips and pull fuel line from airframe.
- Remove quick-disconnect from fuel line.
- Remove jamnut and washer from connector. Remove connector and quick-disconnect from airframe (Figure 14-17, Detail A).
- Separate connector from quick-disconnect by removing screws from connector. Remove connector and packing from quick-disconnect.
- Remove packing from quick-disconnect at station 398.
- Hinge open ESSS platform rear fairing at station 312 (TM 55-1520-237-23-5).
- Uncap and remove quick-disconnect from elbow and remove packing from quick-disconnect (Figure 14-17, Sheet 2, Detail A).

INSTALL

- Lubricate packing, MS29513-215, with petrolatum, Fed. Spec VV-P-236, and install in groove in connector (Figure 14-17, Sheet 1, Detail A).
- Line up holes in connector and quick-disconnect. Connect quick-disconnect to connector with screws.

STEP 16 REPLACE ESSS FUEL LINES AND QUICK-DISCONNECTS STATION 312 TO STATION 398 (CONT)


A
B
A
STA 398
QUICK-DISCONNECT
JAMNUT
PACKING MS29512-10
CONNECTOR
WASHER
NUT (TORQUE 330-360 IN. LBS)
SCREW
SPLIT GROMMET
FUEL LINE
PACKING MS29513-215
QUICK-DISCONNECTS
B
FUEL LINE
FITTING
NUT (TORQUE 330-360 IN. LBS)
STA 312
CAP

NOTE

TIGHTEN JAMNUT 1/6 TO 1/3 TURN PAST POINT WHERE SHARP RISE IN TORQUE IS FELT.

S 74016 (C16)

Figure 14-17 (Sheet 1 of 2)

STEP 16 REPLACE ESSS FUEL LINES AND QUICK-DISCONNECTS STATION 312 TO STATION 398 (CONT)

- Install quick-disconnect and connector in airframe with jamnut and washer. **TIGHTEN JAMNUT 1/6 TO 1/3 TURN PAST POINT WHERE SHARP RISE IN TORQUE IS FELT.**
- Lubricate packing, MS29512-10, with petrolatum, Fed. Spec VV-P-236, and install on quick-disconnect.
- Coat threads of connector with antiseize compound, MIL-A-907, and install quick-disconnect on connector.
- Lubricate packing, MS29512-10, with petrolatum, Fed. Spec VV-P-236, and install on quick-disconnect (Figure 14-17, Sheet 2, Detail A).
- Coat threads of quick-disconnect with antiseize compound, MIL-A-907, and install in elbow.
- Using a wooden or plastic scraper and a clean cloth dampened with trichloroethane, O-T-620, clean edge of holes where split grommets are installed. Do not allow solvent to dry on airframe. Keep turning cloth after each wipe.

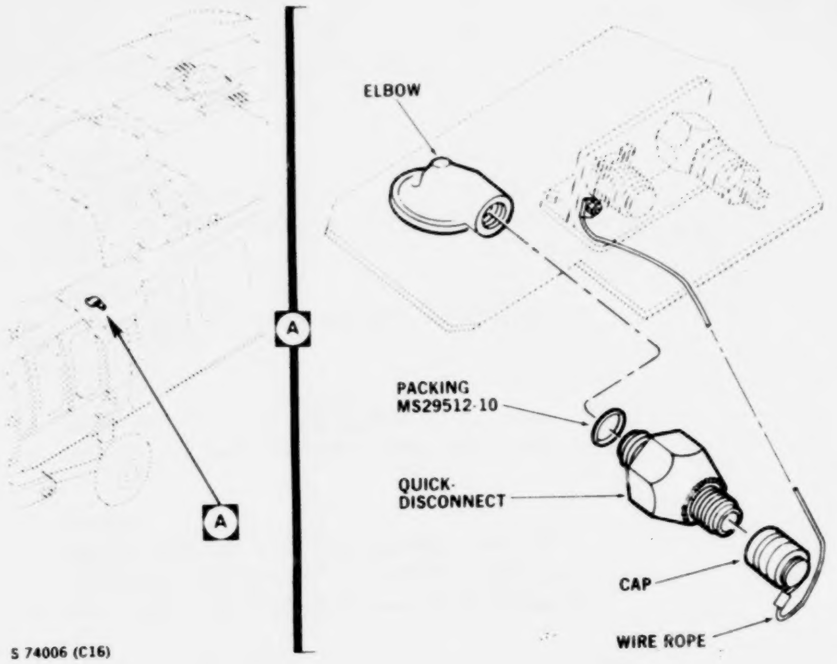


Figure 14-17 (Sheet 2 of 2)

STEP 16 REPLACE ESSS FUEL LINES AND QUICK-DISCONNECTS STATION 312 TO STATION 398 (CONT)

- Install fuel line through holes in fuselage.
- Wipe area clean using a clean cloth.
- Lightly scuff inside of outer groove of grommet with abrasive cloth, P-C-451.
- Apply a light coat of adhesive, Pliobond No. 20, to groove of grommet and edge of hole. Allow adhesive to air-dry for 10 minutes or until tacky.
- Install grommets in hole in airframe. For best results, allow adhesive to cure for 24 hours.
- Connect fuel line to fitting at station 312 (Figure 14-17, Sheet 1, Detail B). **TORQUE NUT ON FUEL LINE TO 330 - 360 INCH-POUNDS.**
- Install fuel line in clips.
- Coat threads of quick-disconnect with anti-seize compound, MIL-A-907, and install in fuel line. **TORQUE NUT ON FUEL LINE TO 330 - 360 INCH-POUNDS.**
- Connect fuel line with quick-disconnect to quick-disconnect at station 398 (Figure 14-17, Sheet 1, Detail A).
- Install cabin overhead soundproofing (TM 55-1520-237-23-5).
- Close and secure platform rear fairing at station 312 (TM 55-1520-237-23-5).

TASK 15

FUEL CELL - REMOVE/INSTALL

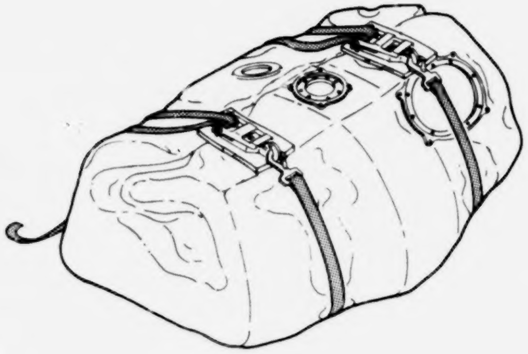
- **REMOVE FUEL CELL - STEP 1**
- **INSTALL FUEL CELL - STEP 2**
- **PRESERVE FUEL CELL - STEP 3**

PERSONNEL REQUIRED

- Two People Required: MOS 67T - Tactical Transport Helicopter Repairer
  Assistant
  (2 additional Assistants are required to help lift cell out of cell compartment, when cell is compressed)

SUPPLIES

- Adhesive, Fed. Spec MMM-A-132 (STEP 2)
- Antiseize Compound, MIL-A-907 (STEPS 2, 3)
- Emery Cloth, Fed. Spec P-C-001673 (STEP 2)
- Engine Oil Fed. Spec MIL-L-22851 (STEP 3)
- Methyl ethyl ketone, Fed. Spec TT-M-261 (STEP 2)
- Packing, MS29512-032 (1 Required, STEP 2)
- Packing, MS29513-215 (1 Required, STEP 2)
- Packing, MS29513-222 (5 Required, STEP 2)
- Packing, MS29513-224 (1 Required, STEP 2)
- Packing, MS29513-230 (8 Required, STEP 2)



S 45163 (B)

SUPPLIES (CONT)
- Packing, MS29513-233 (2 Required, STEP 2)
- Packing, MS29513-243 (1 Required, STEP 2)
- Packing, MS29513-276 (2 Required, STEP 2)
- Packing, MS29513-281 (3 Required, STEP 2)
  (3 Required, STEP 3)
- Petrolatum, Fed. Spec VV-P-236 (STEPS 2, 3)
- Presstite Tape, No. 590 (FSCM 77464) (STEP 2)
- Pressure Sensitive Tape, No. 28, NSN 5970-00-405-4745 (STEP 2)
- Sealing Compound, MIL-S-4383 (STEP 2)
- Sealant, MIL-S-8802 (STEP 2)
- Shim 70307-03015-102 (STEP 2)
- Tiedown Straps, MS3367-2-9 (2 Required, STEP 2)

TOOLS
- Aircraft Mechanic's Toolkit, NSN 5180-00-323-4692
- Torque Wrench, 0-30 in. lbs, NSN 5120-00-117-4832 (STEP 2)
- Torque Wrench, 30-150 in. lbs, NSN 5120-00-542-4489 (STEPS 2, 3)

ALSO NEEDED
- Protective Plugs and Caps (STEP 1)
- Rubber Pads (6" x 12" x 1/4") (2 Required, STEPS 1, 2)
- Suitable Container to Catch Fuel (STEP 1)
- TASK 11 (STEPS 1, 2, 3)
- TASK 12 (STEP 2)

ALSO NEEDED (CONT)

- TASK 13 (STEPS 1, 2)
- TASK 18 (STEP 2)
- Tiedown Straps, Cargo Aircraft, Type CGU-1/B, NSN 1670-00-725-1437 (4 Required, STEPS 1, 2)
- TM 55-1500-204-25/1 (STEPS 1, 2, 3)
- TM 55-1520-237-23-9 (STEP 2)

STEP 1 REMOVE FUEL CELL

CAUTION

To prevent damage to fuel cell, do not remove cell from helicopter unless work area temperature is above 70°F (21°C).

NOTE

The following procedures apply to both No. 1 and No. 2 fuel cells.

STEP 1 REMOVE FUEL CELL (CONT)

DEFUEL

- Turn off all electrical power.
- Defuel fuel cells (TASK 11).
- Drain fuel cell sump (TASK 11).
- Purge fuel cell of fumes (TM 55-1500-204-25/1).

REMOVE

- On UH-60A helicopters, do this:
  - Remove troop seats from rear cabin (TM 55-1520-237-23-5).
  - Remove soundproofing from left and right stowage compartments and center structure in cabin midsection.
  - Unhook cargo netting to get into compartments.
- On EH-60A helicopters, remove plenum, evaporator pallet, condenser pallet and supply ducting (TM 55-1520-237-23-5).
- Unlock studs fastening left and right panels on top of fuel cells. Remove panels from compartments.
- Remove screws, and front and top panel from structure.
- Remove screws and bonding jumpers from vent tubes.
- Disconnect front vent tubes from vent valves and vent tube Y. Disconnect vent tube Y from rear panel. Remove packings from vent tubes.

CAUTION

To avoid damaging UHF antenna in transition section tub, protect antenna with a temporary protective cover before entering tail cone area.

STEP 1 REMOVE FUEL CELL (CONT)

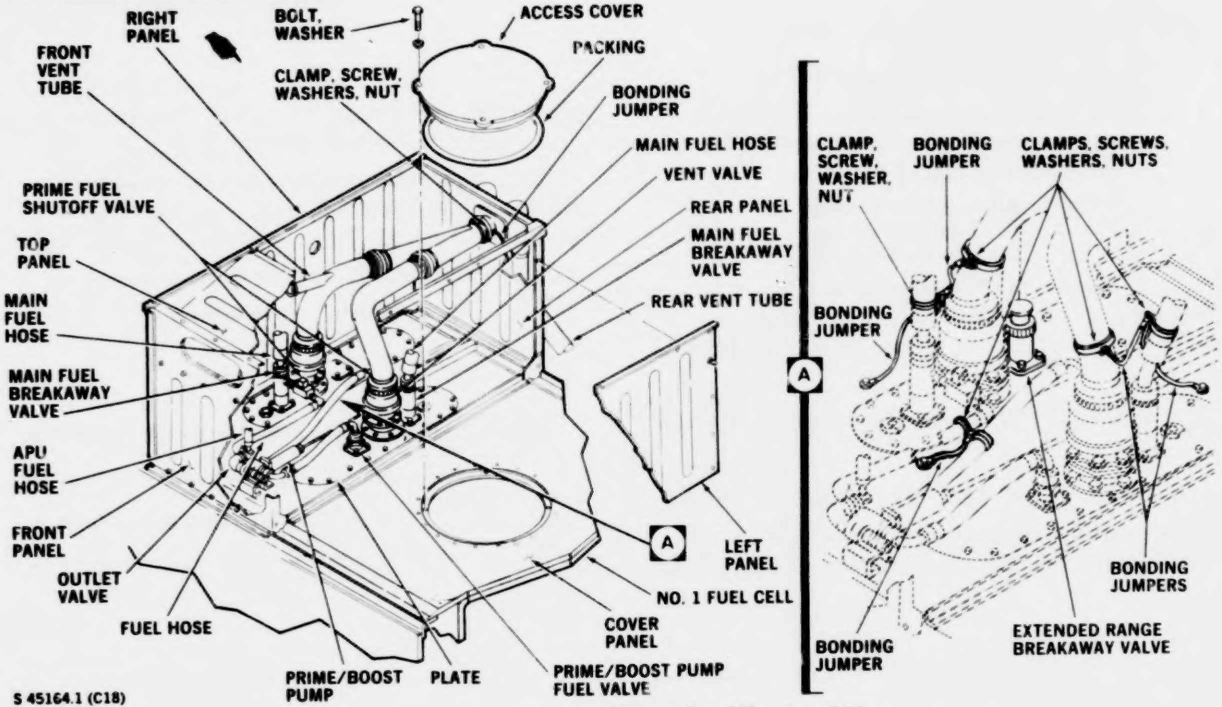

RIGHT PANEL
BOLT, WASHER
ACCESS COVER
FRONT VENT TUBE
PACKING
CLAMP, SCREW, WASHERS, NUT
BONDING JUMPER
MAIN FUEL HOSE
VENT VALVE
PRIME FUEL SHUTOFF VALVE
REAR PANEL
TOP PANEL
MAIN FUEL BREAKAWAY VALVE
MAIN FUEL HOSE
REAR VENT TUBE
MAIN FUEL BREAKAWAY VALVE
APU FUEL HOSE
A
FRONT PANEL
LEFT PANEL
OUTLET VALVE
NO. 1 FUEL CELL
FUEL HOSE
COVER PANEL
PRIME/BOOST PUMP
PLATE
PRIME/BOOST PUMP FUEL VALVE
S 45164.1 (C18)
CLAMP, SCREW, WASHER, NUT
BONDING JUMPER
CLAMPS, SCREWS, WASHERS, NUTS
BONDING JUMPER
A
BONDING JUMPERS
EXTENDED RANGE BREAKAWAY VALVE
BONDING JUMPER

Figure 15-1 (Sheet 1 of 7)

STEP 1 REMOVE FUEL CELL (CONT)

- Disconnect rear vent tube from rear panel and transition section bottom. Remove packings from vent tube.
- Remove screws and rear panel from structure.

WARNING

To prevent damage to equipment or injury to personnel, follow normal precautions while doing this job. Use suitable container to catch fuel when draining fuel lines.

STEP 1 REMOVE FUEL CELL (CONT)

- Disconnect electrical plug from prime fuel shutoff valve.
- On helicopters with MWO 55-1520-237-50-25 installed, do this:
  - Disconnect electrical connector from pressure switch.
  - Disconnect fuel boost pump electrical connector.
- If removing No. 1 fuel cell, disconnect fuel hoses from both prime fuel shutoff valves and prime/boost pump outlet valve. Plug hoses and cap outlet valve and prime/boost pump fuel breakaway valve. Disconnect electrical plug from prime/boost pump.
- If removing No. 2 fuel cell, disconnect fuel hose from prime fuel shutoff valve. Cap fuel shutoff valve and plug fuel hose.
- Disconnect main fuel hose from main fuel breakaway valve. Remove packing from main fuel valve. Cap main fuel valve and plug main fuel hose.
- Unbolt and remove access covers from both fuel cells. Remove packings from covers.
- Remove screws holding cover panel to fuel cell compartment structure.
- Remove screws holding bonding jumpers to cover panel.
- Unbolt sump drain valve from fuel cell. Remove packing from valve.
- Unbolt gravity fill adapter unit from fuel cell. Remove packing from adapter unit.
- Remove bolts and washers fastening fuel cell to refueling panel.

STEP 1 REMOVE FUEL CELL (CONT)

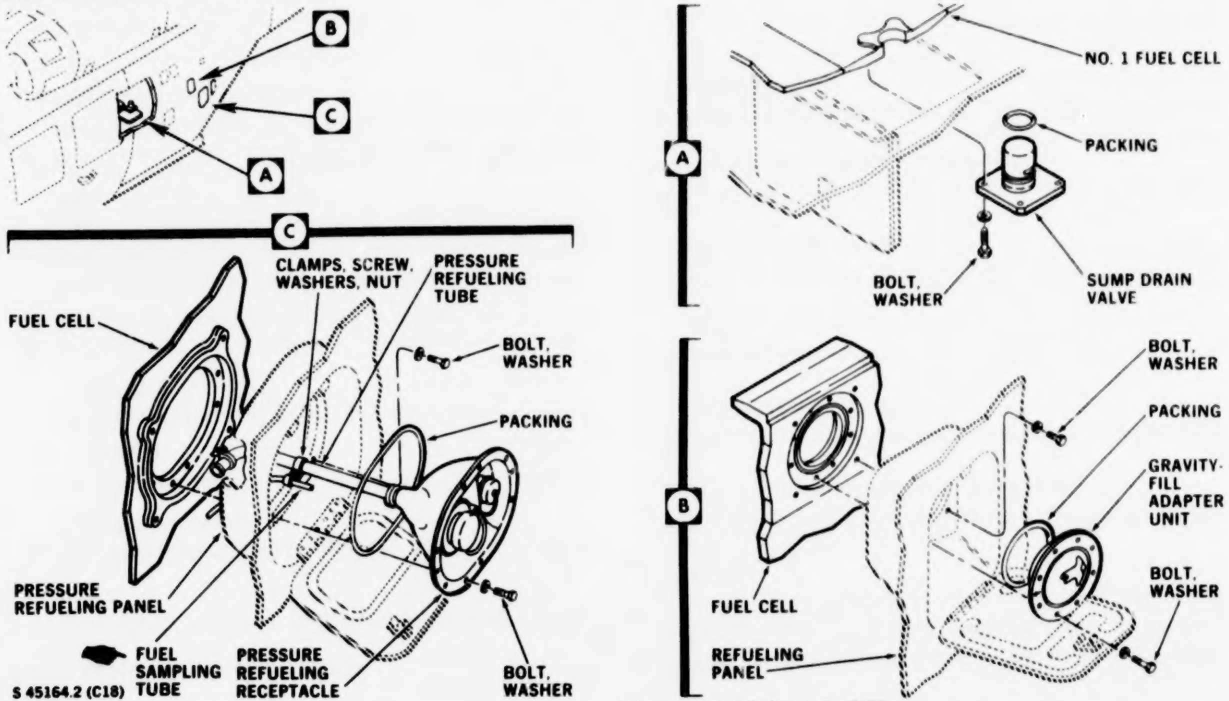
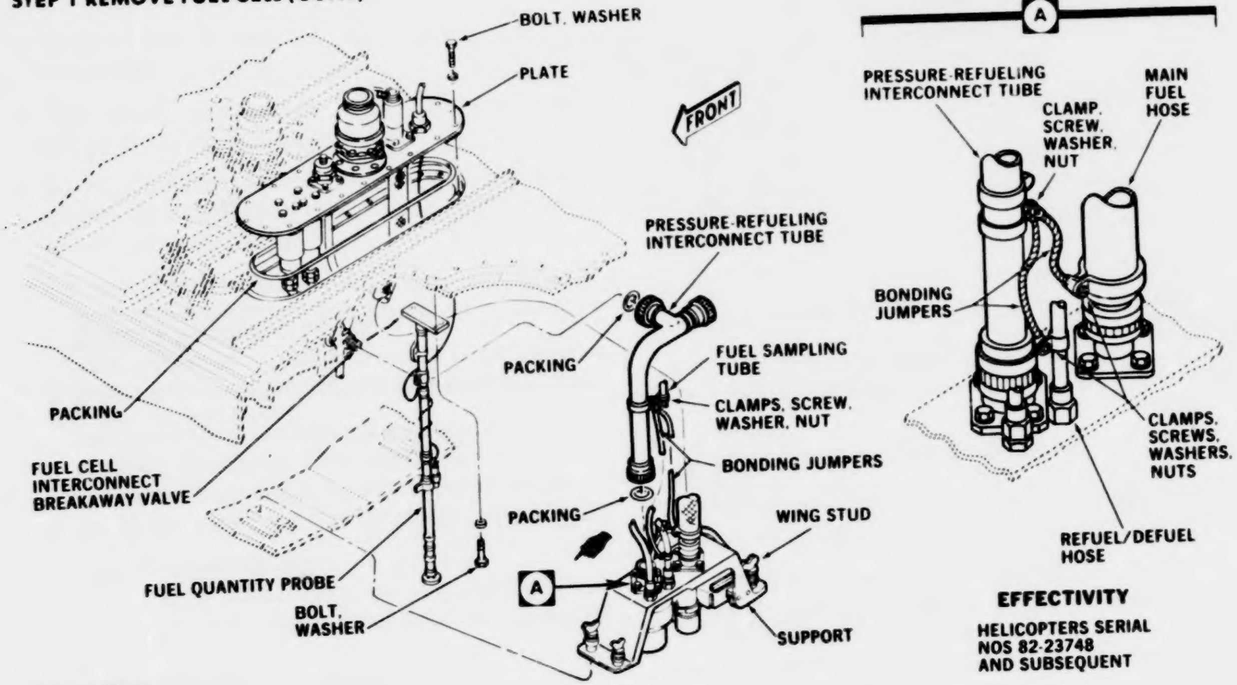

B
C
A
C
CLAMPS, SCREW, WASHERS, NUT
PRESSURE REFUELING TUBE
FUEL CELL
BOLT, WASHER
PACKING
PRESSURE REFUELING PANEL
FUEL SAMPLING TUBE
PRESSURE REFUELING RECEPTACLE
BOLT, WASHER
S 45164.2 (C18)
A
NO. 1 FUEL CELL
PACKING
BOLT, WASHER
SUMP DRAIN VALVE
B
BOLT, WASHER
PACKING
GRAVITY-FILL ADAPTER UNIT
FUEL CELL
BOLT, WASHER
REFUELING PANEL

Figure 15-1 (Sheet 2 of 7)

STEP 1 REMOVE FUEL CELL (CONT)

- Remove screw and bonding jumper from clamp on pressure refueling tube in No. 1 fuel cell.
- Disconnect clamp that attaches pressure refueling tube to fuel sampling tube.
- Remove screws and clamps holding tube to support in bottom of fuel cell.
- Remove screws and brackets holding tube to inside top of fuel cell. Remove tube from fuel cell.
- Remove bolts holding plate to fuel cell.
- On No. 1 fuel cell only, disconnect pressure refueling interconnect tube from pressure refueling tube. Unbolt pressure refueling receptacle and pressure refueling tube from fuel cell. Remove packing from pressure refueling receptacle. Remove bolts holding fuel cell to pressure refueling panel. Remove pressure refueling tube and packing from pressure refueling receptacle.
- Remove screw and bonding jumper from clamps on hose and pressure refueling interconnect tube in each fuel cell.

STEP 1 REMOVE FUEL CELL (CONT)


BOLT, WASHER
PLATE
FRONT
PACKING
FUEL CELL INTERCONNECT BREAKAWAY VALVE
FUEL QUANTITY PROBE
BOLT, WASHER
PRESSURE-REFUELING INTERCONNECT TUBE
PACKING
FUEL SAMPLING TUBE
CLAMPS, SCREW, WASHER, NUT
BONDING JUMPERS
PACKING
WING STUD
A
SUPPORT
A
PRESSURE-REFUELING INTERCONNECT TUBE
CLAMP, SCREW, WASHER, NUT
MAIN FUEL HOSE
BONDING JUMPERS
CLAMPS, SCREWS, WASHERS, NUTS
REFUEL/DEFUEL HOSE

EFFECTIVITY

HELICOPTERS SERIAL NOS 82-23748 AND SUBSEQUENT

S 45164.3 (C18)

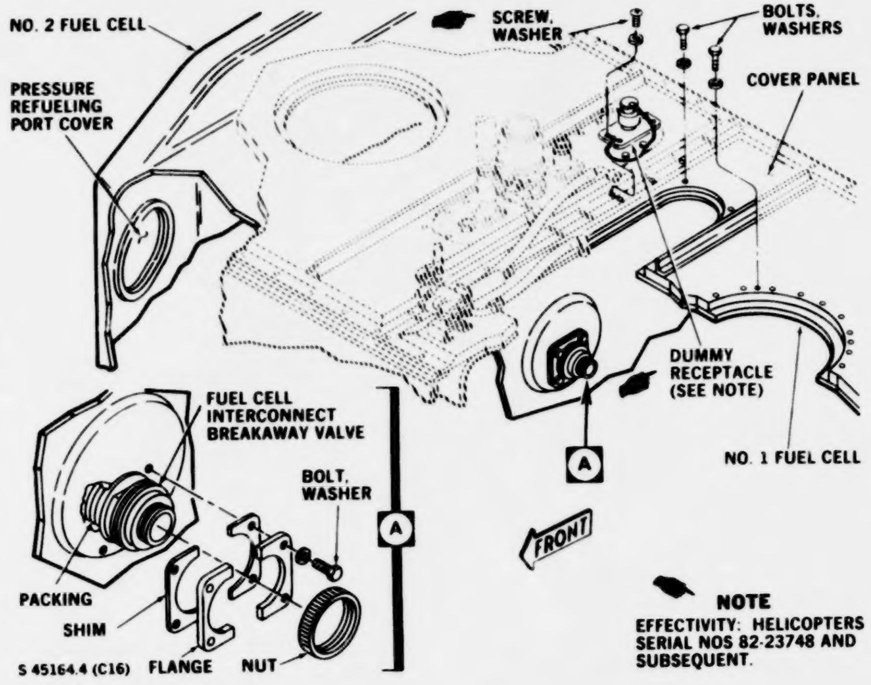
Figure 15-1 (Sheet 3 of 7)

STEP 1 REMOVE FUEL CELL (CONT)

- Inside fuel cell, disconnect pressure refueling interconnect tube from union and fuel cell interconnect breakaway valve.
- Inside No. 1 fuel cell, on helicopters serial Nos 82-23748 and subsequent, or with extended range kit installed, disconnect extended range interconnect hose from pressure refueling interconnect tube.
- Remove pressure refueling interconnect tubes from fuel cells. Remove packings from pressure refueling interconnect tubes.
- Disconnect fuel quantity probe electrical wiring harness from upper fuel enclosure panel. Remove straps holding wiring to main fuel hose. Unbolt fuel quantity probe from fuel cell.
- On helicopters with MWO 55-1520-237-50-25 installed, remove fuel boost pump (TASK 13).
- Unlock wing studs holding support to bottom of fuel cell.
- Carefully remove plate with attached components and fuel quantity probe from fuel cell.
- Remove packing from fuel cell plate opening.

STEP 1 REMOVE FUEL CELL (CONT)

- Remove bolts holding fuel cell to cover panel at access cover and plate opening.
- From inside each fuel cell, remove nut from fuel cell interconnect breakaway valve.
- Unbolt shims and flanges from fuel cell. Remove interconnect breakaway valve from both cells. Remove packings from valve.
- On helicopters serial Nos 82-23748 and subsequent, remove screws and dummy receptacle from cover panels.
- With assistant, remove fuel cell cover panel from fuel cell compartment.


NO. 2 FUEL CELL
SCREW, WASHER
BOLTS, WASHERS
COVER PANEL
PRESSURE REFUELING PORT COVER
DUMMY RECEPTACLE (SEE NOTE)
NO. 1 FUEL CELL
A
FRONT
FUEL CELL INTERCONNECT BREAKAWAY VALVE
BOLT, WASHER
A
PACKING
SHIM
FLANGE
NUT
S 45164.4 (C16)

NOTE
EFFECTIVITY: HELICOPTERS SERIAL NOS 82-23748 AND SUBSEQUENT.

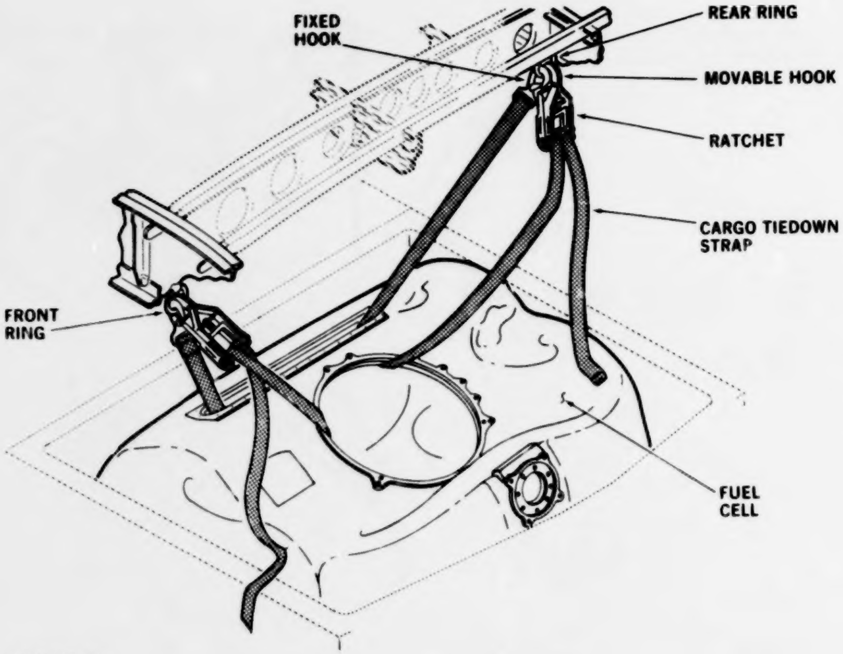
Figure 15-1 (Sheet 4 of 7)

STEP 1 REMOVE FUEL CELL (CONT)

CAUTION

To prevent damage to fuel cell, do not remove cell unless work area and cell temperature is above 70°F (21°C).

- Loop two cargo tiedown straps, NSN 1670-00-725-1437, through the fuel cell access cover and plate openings, one to front of cell, other to rear.
- Hook fixed and movable hook on front strap to front ring in transition ceiling.
- Hook fixed and movable hook on rear strap to rear ring in transition ceiling.
- Remove slack from both tiedown straps, and using ratchets, hoist fuel cell as high as possible out of cell compartment.


FIXED HOOK
REAR RING
MOVABLE HOOK
RATCHET
CARGO TIEDOWN STRAP
FRONT RING
FUEL CELL

S 45164.5 (B)

Figure 15-1 (Sheet 5 of 7)

STEP 1 REMOVE FUEL CELL (CONT)

- Install two other cargo tiedown straps around fuel cell as shown. Put rubber pad against cell under each ratchet to protect cell from damage.
- Lower fuel cell back in cell compartment.
- Remove straps used to hoist cell.
- With one man standing on top of fuel cell, alternately tighten each cargo tiedown strap and slowly compress fuel cell.

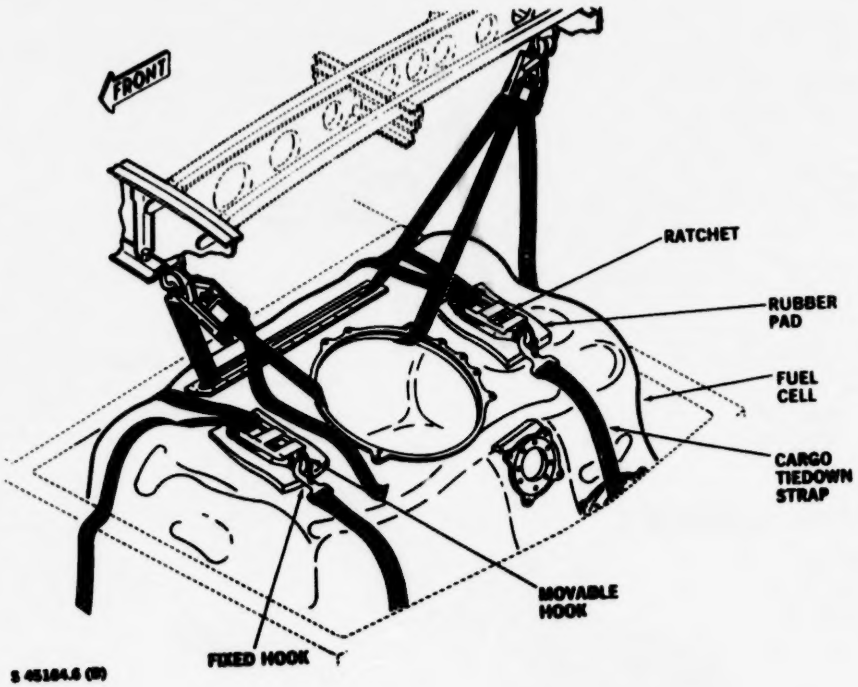

FRONT
RATCHET
RUBBER PAD
FUEL CELL
CARGO TIEDOWN STRAP
MOVABLE HOOK
FIXED HOOK
S 45184.6 (B)

Figure 15-1 (Sheet 6 of 7)

STEP 1 REMOVE FUEL CELL (CONT)

- Compress fuel cell until gravity fill port is centered and level on top of cell and interconnect port is about 6 inches away from compartment bulkhead, as shown.
- Using four men, (one on each corner of cell), lift compressed cell out of compartment and remove from helicopter.
- If replacing No. 2 fuel cell, remove pressure refueling port cover from fuel cell for installation on replacement cell.

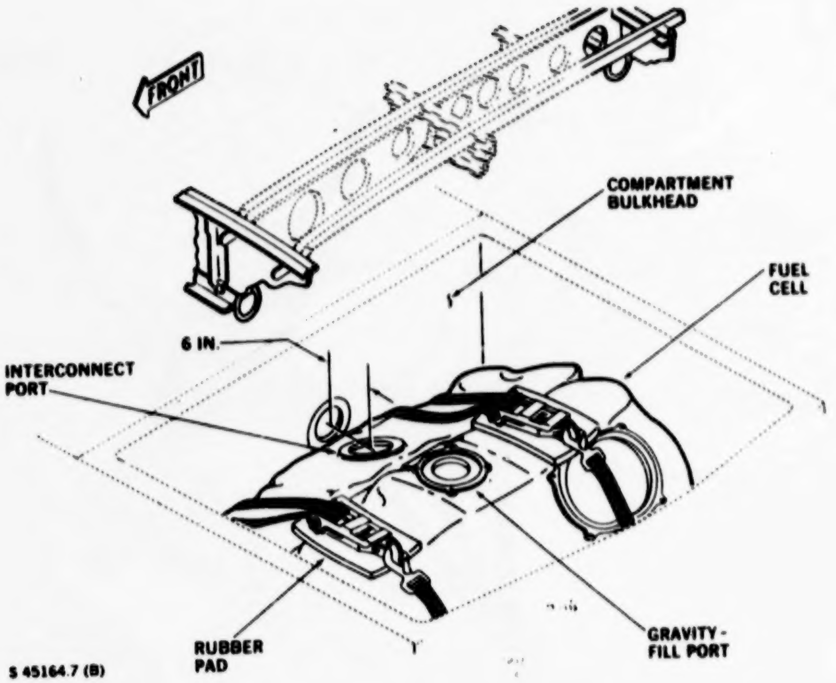

FRONT
COMPARTMENT BULKHEAD
FUEL CELL
6 IN.
INTERCONNECT PORT
RUBBER PAD
GRAVITY-FILL PORT
S 45164.7 (B)

Figure 15-1 (Sheet 7 of 7)

STEP 2 INSTALL FUEL CELL

NOTE

The following procedures apply to both No. 1 and No. 2 fuel cells.

- Turn off all electrical power.
- Check gravity and pressure refueling panels inside of fuel cell compartment to see if any filler blocks on bolt attachment holes have broken off, or become unbonded.
- If required, rebond unbonded filler blocks to refueling panels as follows:
  - Clean bonding surface on refueling panel and filler block with methyl ethyl ketone, Fed. Spec TT-M-261.
  - Rough up bonding surface on refueling panel and filler block with emery cloth, Fed. Spec P-C-001673.
  - Clean bonding surfaces again with methyl ethyl ketone.
  - Lightly coat bonding surface on refueling panel and filler block with adhesive, Fed. Spec MMM-A-132.
  - Line up bolt holes in filler block and refueling panel and press block on panel. Allow adhesive to cure at room temperature for 12 hours.

STEP 2 INSTALL FUEL CELL (CONT)

- If installing No. 2 fuel cell, lubricate packing. MS29513-276, with petrolatum, Fed. Spec VV-P-236. Install packing in groove on pressure refueling port cover. Fasten cover to fuel cell with screws.
- Clean cover and surrounding area with methylethyl ketone, Fed. Spec TT-M-261.
- Tape cover and surrounding area with 3-inch, No. 28 pressure sensitive tape.
- Coat taped area, and 1/2-inch beyond edge of tape with sealing compound MIL-S-4383.
- Let area air cure at least 24 hours at room temperature.
- Make sure fuel cell compartment is free of all dirt, rags, and tools.

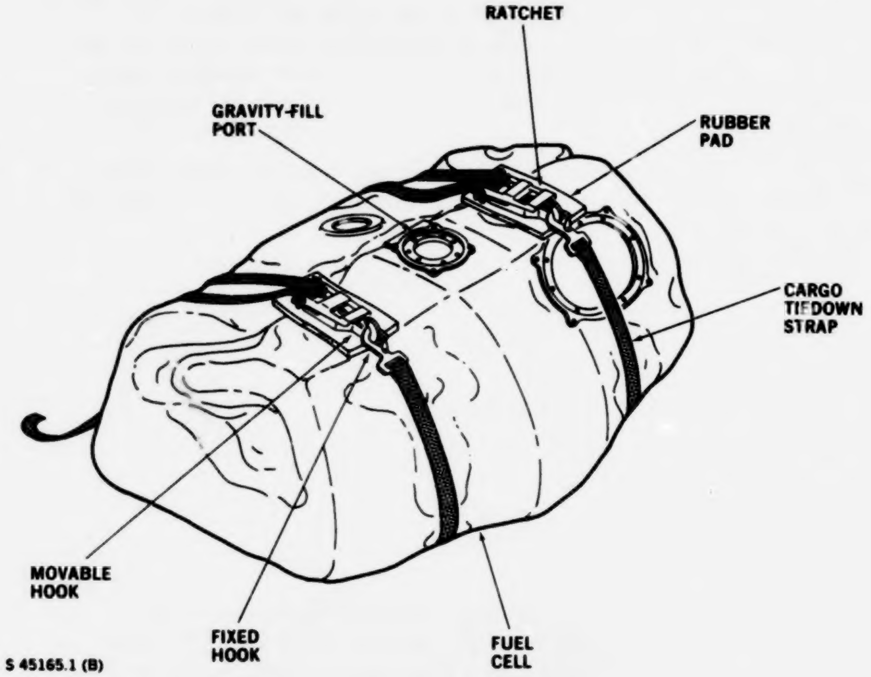

RATCHET
GRAVITY-FILL PORT
RUBBER PAD
CARGO TIEDOWN STRAP
MOVABLE HOOK
FIXED HOOK
FUEL CELL
S 45165.1 (B)

Figure 15-2 (Sheet 1 of 8)

STEP 2 INSTALL FUEL CELL (CONT)

CAUTION

To prevent damage to fuel cell, do not compress cell unless work area and cell temperature is above 70°F (21°C).

- Install two tiedown cargo straps, NSN 1670-00-725-1437, around fuel cell as shown. Put a rubber pad against cell under each ratchet to protect cell against damage. Slowly compress fuel cell by stepping and kneeling on cell and alternately tightening each cargo tiedown strap.
- Compress fuel cell until gravity fill port is centered and level on top of cell.

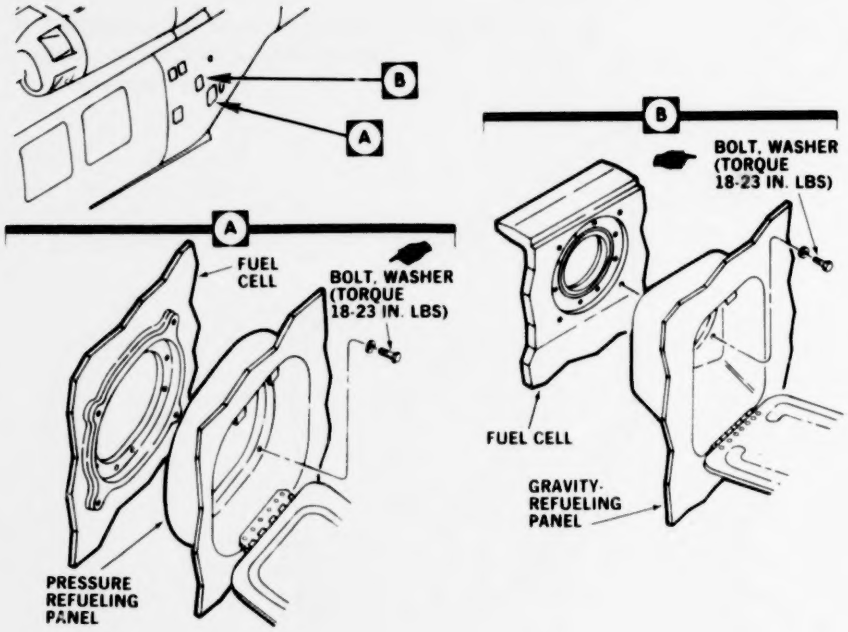
STEP 2 INSTALL FUEL CELL (CONT)

- With aid of assistant, lift and place fuel cell in fuel cell compartment. Push four corners of cell into compartment, and release tension on cargo tiedown straps.

- Remove cargo tiedown straps from fuel cell. To ease removal of straps, hook strap movable hook to front or rear ring in transition ceiling and use ratchet to work strap out.

- With aid of assistant inside of fuel cell, line up bolt holes on gravity refueling panel and fuel cell. Coat threads of bolts with anti-seize compound, MIL-A-907, and bolt fuel cell to refueling panel. **TORQUE BOLTS TO 18 - 23 INCH-POUNDS.**

- On No. 1 fuel cell only, line up bolt holes on pressure refueling panel and fuel cell. Coat threads of bolts with anti-seize compound, MIL-A-907, and bolt fuel cell to refueling panel. **TORQUE BOLTS TO 18 - 23 INCH-POUNDS.**


B
A
A
FUEL CELL
BOLT, WASHER (TORQUE 18-23 IN. LBS)
PRESSURE REFUELING PANEL
B
BOLT, WASHER (TORQUE 18-23 IN. LBS)
FUEL CELL
GRAVITY-REFUELING PANEL

S 45165.2 (C6)

Figure 15-2 (Sheet 2 of 8)

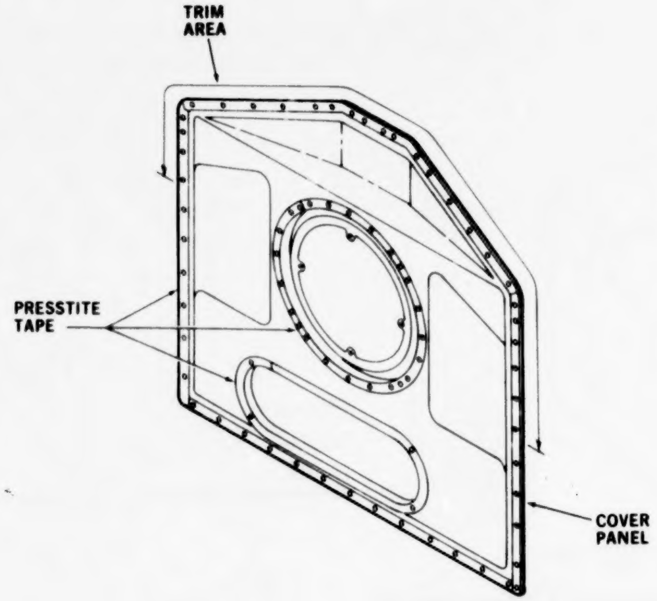
STEP 2 INSTALL FUEL CELL (CONT)

- Put Presstite tape, No. 590, around all openings and outside edges on bottom of cover panel as shown. Poke open screw holes with small pointed tool.
- With assistant, install cover panel on top of fuel cell compartment with washers and screws.

NOTE

If cover panel edge binds against helicopter frame, trim area using procedures in TM 55-1500-204-25/1.

- On helicopters serial Nos 82-23748 and subsequent, install dummy receptacle over cover panels with screws and washers.
- Coat threads of bolts with anti-seize compound, MIL-A-907. With assistant, bolt top of fuel cell to cover panel at access cover and plate assembly openings with washers and bolts. **TORQUE BOLTS TO 18 - 23 INCH-POUNDS.**



S 45165.3 (C5)

Figure 15-2 (Sheet 3 of 8)

STEP 2 INSTALL FUEL CELL (CONT)

- Lubricate packings, MS29513-233, with petrolatum, Fed. Spec VV-P-236. Install packings on fuel cell interconnect breakaway valve.
- Insert fuel cell interconnect breakaway valve into both fuel cell interconnect ports.

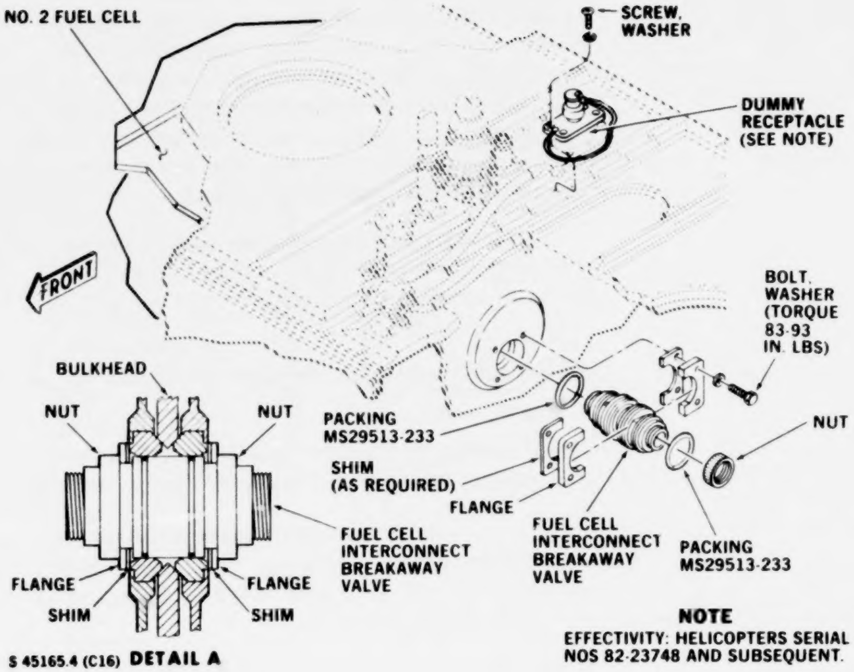
STEP 2 INSTALL FUEL CELL (CONT)

- Inside each fuel cell, install flange halves on flats on interconnect breakaway valve. Install nuts on valve and handtighten nuts against flanges. Push cells against bulkhead between two cells. Push and pull valve to see if it can be moved between cells. If valve can be moved, install shims, 70307-03015-102, as required to remove endplay, in each fuel cell between flange halves and fuel cell.
- Remove nuts from interconnect breakaway valve. Coat threads on valve and flange attachment bolts with anti-seize compound, MIL-A-907.

CAUTION

When installing knurled nuts, handtighten only. Using pliers or other tools can damage interconnect breakaway valve.

- If required, install shim halves between flange halves and fuel cell, on valve flats. Bolt flanges to fuel cells. **TORQUE BOLTS TO 83 - 93 INCH-POUNDS. HANDTIGHTEN NUTS AGAINST FLANGES.**
- Lubricate packing, MS29513-281, with petrolatum, Fed. Spec VV-P-236. Install packing in groove in fuel cell plate opening.


NO. 2 FUEL CELL
SCREW, WASHER
DUMMY RECEPTACLE (SEE NOTE)
FRONT
BOLT, WASHER (TORQUE 83-93 IN. LBS)
BULKHEAD
NUT
NUT
PACKING MS29513-233
NUT
SHIM (AS REQUIRED)
FLANGE
FUEL CELL INTERCONNECT BREAKAWAY VALVE
FUEL CELL INTERCONNECT BREAKAWAY VALVE
PACKING MS29513-233
FLANGE
FLANGE
SHIM
SHIM
S 45165.4 (C16)
DETAIL A

NOTE

EFFECTIVITY: HELICOPTERS SERIAL NOS 82-23748 AND SUBSEQUENT.

Figure 15-2 (Sheet 4 of 8)

STEP 2 INSTALL FUEL CELL (CONT)

- Carefully install plate with attached components and fuel quantity probe into fuel cell.
- If fuel boost pump was removed, install it (TASK 13).
- Coat threads of bolts with antiseize compound, MIL-A-907. Bolt plate to fuel cell with washers and bolts. **TORQUE BOLTS TO 43 - 48 INCH-POUNDS.**
- Connect fuel quantity probe electrical wiring harness to upper fuel enclosure panel.

NOTE

Make sure oval bolt holes on mounting plate face outboard when installing fuel quantity probe.

- Coat threads of bolts with antiseize compound, MIL-A-907. Bolt fuel quantity probe to inside top of fuel cell with washers and bolts. **TORQUE BOLTS TO 18 - 23 INCH-POUNDS.**
- Secure fuel quantity probe wiring to main fuel hose with tiedown straps, MS3367-2-9.
- Lock wing studs fastening support to bottom of fuel cell.
- Lubricate packings, MS29513-222, with petrolatum, Fed. Spec VV-P-236. Install packings on pressure refueling interconnect tubes.
- Coat threads on union and fuel cell interconnect breakaway valve with antiseize compound, MIL-A-907.
- Place pressure refueling interconnect tube in each fuel cell.
- Inside No. 1 fuel cell, connect pressure refueling interconnect tube to union and fuel cell interconnect breakaway valve. **HANDTIGHTEN NUTS.**
- Inside No. 2 fuel cell, connect pressure refueling interconnect tube to union and fuel cell interconnect breakaway valve. On helicopters serial Nos 82-23748 and subsequent, or with extended range kit installed, lubricate packing, MS29513-222, with petrolatum, Fed. Spec VV-P-236. Install packing and extended range interconnect hose on pressure refuel interconnect tube. **HANDTIGHTEN NUTS.**

STEP 2 INSTALL FUEL CELL (CONT)

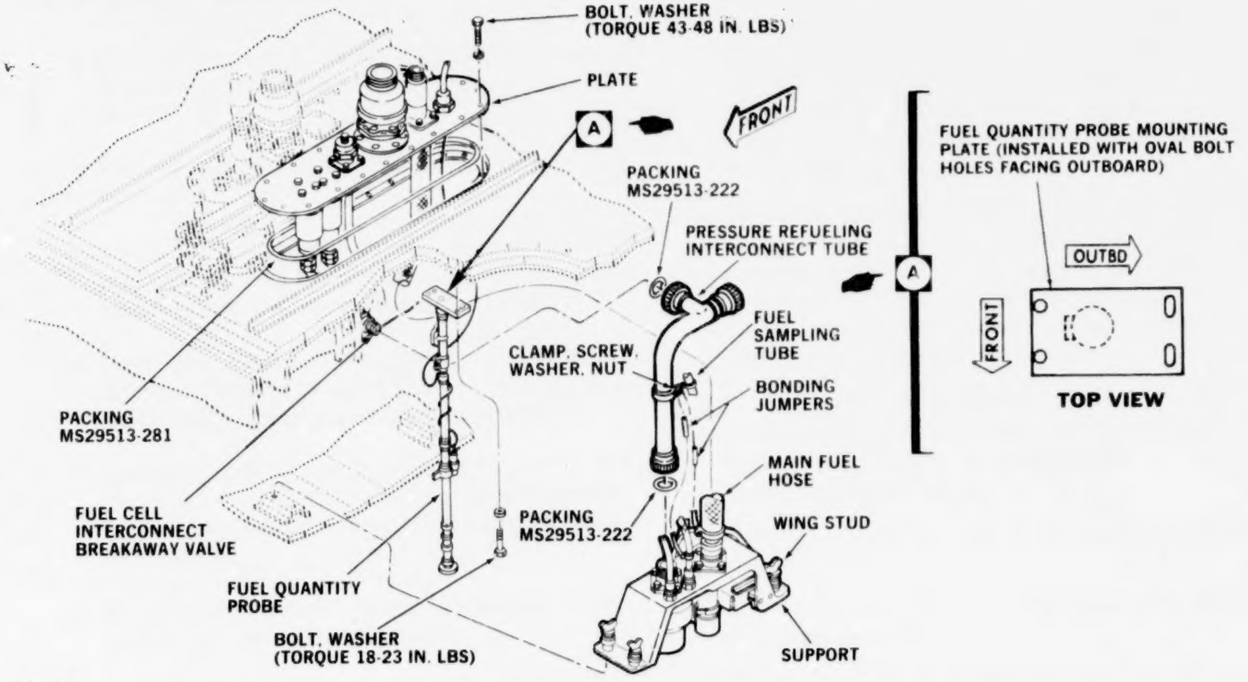

BOLT, WASHER
(TORQUE 43-48 IN. LBS)
PLATE
A
FRONT
PACKING
MS29513-222
PRESSURE REFUELING
INTERCONNECT TUBE
FUEL QUANTITY PROBE MOUNTING
PLATE (INSTALLED WITH OVAL BOLT
HOLES FACING OUTBOARD)
OUTBD
FRONT
TOP VIEW
A
FUEL
SAMPLING
TUBE
CLAMP, SCREW,
WASHER, NUT
BONDING
JUMPERS
PACKING
MS29513-281
MAIN FUEL
HOSE
FUEL CELL
INTERCONNECT
BREAKAWAY VALVE
PACKING
MS29513-222
WING STUD
FUEL QUANTITY
PROBE
BOLT, WASHER
(TORQUE 18-23 IN. LBS)
SUPPORT
S 45165.5

Figure 15-2 (Sheet 5 of 8)

STEP 2 INSTALL FUEL CELL (CONT)

- Coat threads on union and fuel cell interconnect breakaway valve with antiseize compound, MIL-A-907.
- Place pressure refueling interconnect tube in each fuel cell.
- Inside No. 1 fuel cell, connect pressure refueling interconnect tube to union and fuel cell interconnect breakaway valve. **HANDTIGHTEN NUTS.**
- Inside No. 2 fuel cell, connect pressure refueling interconnect tube to union and fuel cell interconnect breakaway valve. **HANDTIGHTEN NUTS.**
- Connect bonding jumper on main fuel hose, and clamps on fuel sampling tube and pressure refueling interconnect tube, together with screw, washers, and nut.
- Install tube in fuel cell. Fasten brackets on tube to inside top of fuel cell with screws.
- Fasten clamps on tube to support in bottom of fuel cell with screws, washers, and nuts.
- If installing No. 1 fuel cell, uncap and coat threads on prime/boost pump fuel valve and prime/boost pump outlet valve with antiseize compound, MIL-A-907. Unplug and connect fuel hoses to prime/boost pump fuel breakaway valve and prime/boost pump outlet valve. Connect electrical plug to prime/boost pump.
- Lubricate packing, MS29513-215, with petrolatum, VV-P-236. Uncap main valve and install packing on valve. Coat threads on main fuel breakaway valve with antiseize compound, MIL-A-907. Unplug and connect main fuel hose to main fuel breakaway valve.
- Uncap prime fuel shutoff valve. Coat threads on prime fuel shutoff valve with antiseize compound, MIL-A-907. Unplug and connect fuel hose to prime fuel shutoff valve.
- Connect electrical plug to prime fuel shutoff valve.
- If electrical connector was disconnected, connect it to pressure switch.
- If fuel boost pump electrical connector was disconnected, connect it.

STEP 2 INSTALL FUEL CELL (CONT)

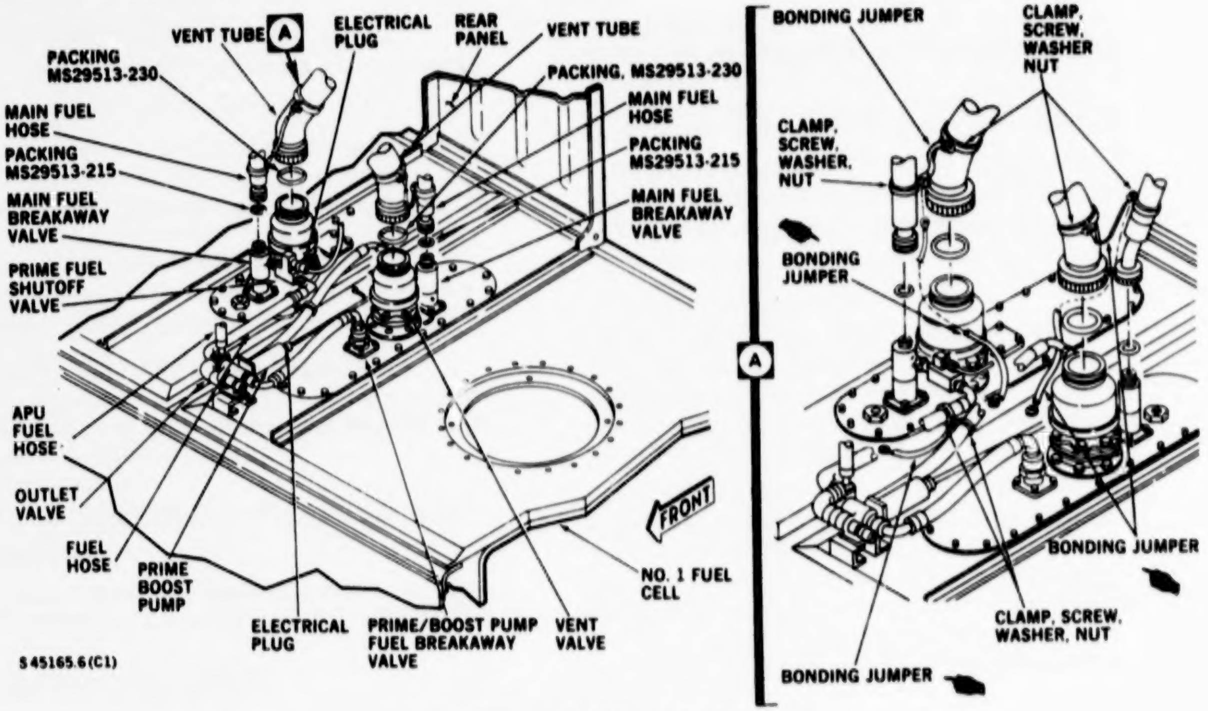

VENT TUBE
A
ELECTRICAL PLUG
REAR PANEL
VENT TUBE
PACKING MS29513-230
PACKING, MS29513-230
MAIN FUEL HOSE
MAIN FUEL HOSE
PACKING MS29513-215
PACKING MS29513-215
MAIN FUEL BREAKAWAY VALVE
MAIN FUEL BREAKAWAY VALVE
PRIME FUEL SHUTOFF VALVE
APU FUEL HOSE
OUTLET VALVE
FUEL HOSE
PRIME BOOST PUMP
ELECTRICAL PLUG
PRIME/BOOST PUMP FUEL BREAKAWAY VALVE
VENT VALVE
FRONT
NO. 1 FUEL CELL
S 45165.6(C1)
A
BONDING JUMPER
CLAMP, SCREW, WASHER NUT
CLAMP, SCREW, WASHER, NUT
BONDING JUMPER
BONDING JUMPER
CLAMP, SCREW, WASHER, NUT
BONDING JUMPER

Figure 15-2 (Sheet 6 of 8)

STEP 2 INSTALL FUEL CELL (CONT)

- Fasten rear panel to structure with washers and screws.

- Lubricate MS29513-230 packings with petrolatum, Fed. Spec VV-P-236. Install packings on ends of front and rear vent tubes. Connect vent tube Y to rear panel. Connect front vent tubes to vent valves and vent tube Y. Connect rear vent tube to rear panel and transition section bottom.

- Connect bonding jumpers to clamps on vent tubes with screws, washers, and nuts.

- Connect bonding jumpers to cover panel with washers and screws.

- On No. 1 fuel cell only:
  - Lubricate packing, MS29513-276, with petrolatum, Fed. Spec VV-P-236.
  - Install packing in groove on pressure refueling receptacle.
  - Lubricate packings, MS29513-222, with petrolatum, Fed. Spec VV-P-236.
  - Install packings on ends of pressure refueling tube.
  - Connect pressure refueling tube to pressure refueling receptacle.
  - Install pressure refueling receptacle and pressure refueling tube into fuel cell.
  - Coat threads of bolts with anti-seize compound, MIL-A-907, and bolt pressure refueling receptacle and bonding jumper to fuel cell. **TORQUE BOLTS TO 43 - 48 INCH-POUNDS.**
  - Connect clamp on pressure refueling tube to clamp on sampling hose guide tube.

STEP 2 INSTALL FUEL CELL (CONT)

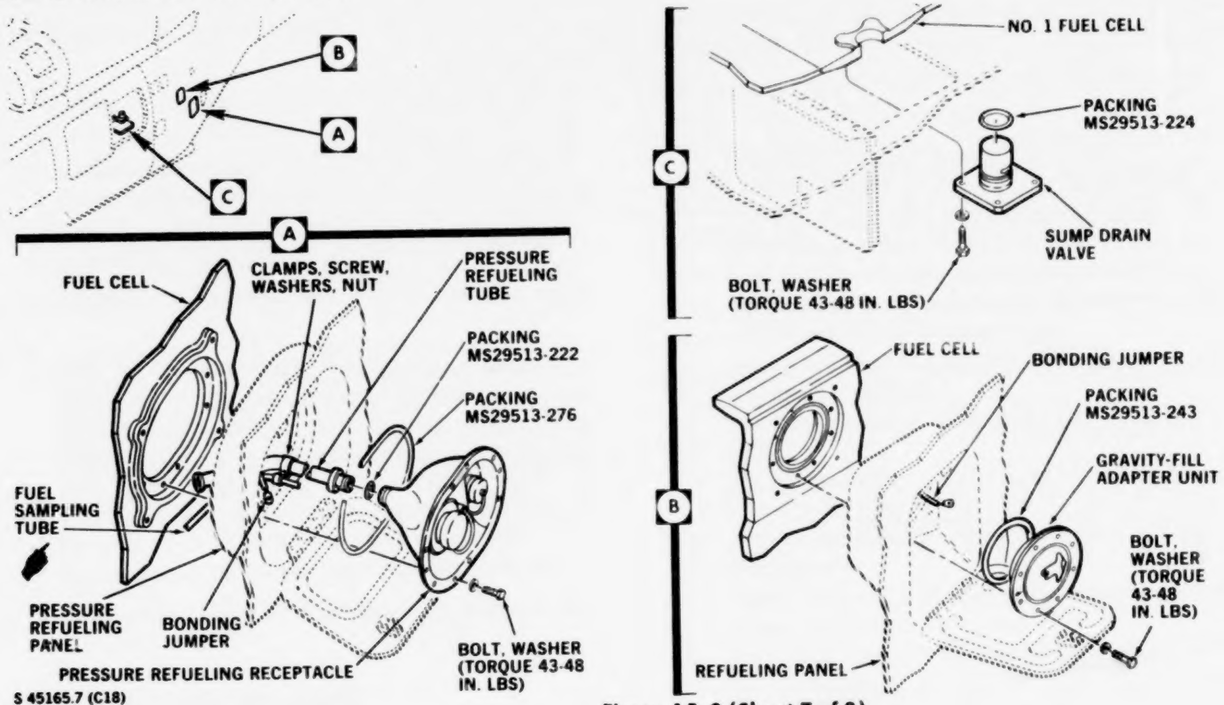

B
A
C
A
FUEL CELL
CLAMPS, SCREW, WASHERS, NUT
PRESSURE REFUELING TUBE
PACKING MS29513-222
PACKING MS29513-276
FUEL SAMPLING TUBE
PRESSURE REFUELING PANEL
BONDING JUMPER
PRESSURE REFUELING RECEPTACLE
BOLT, WASHER (TORQUE 43-48 IN. LBS)
S 45165.7 (C18)
C
NO. 1 FUEL CELL
PACKING MS29513-224
SUMP DRAIN VALVE
BOLT, WASHER (TORQUE 43-48 IN. LBS)
B
FUEL CELL
BONDING JUMPER
PACKING MS29513-243
GRAVITY-FILL ADAPTER UNIT
BOLT, WASHER (TORQUE 43-48 IN. LBS)
REFUELING PANEL

Figure 15-2 (Sheet 7 of 8)

STEP 2 INSTALL FUEL CELL (CONT)

- Inside fuel cell, coat threads on pressure refueling interconnect tube with anti-seize compound, MIL-A-907. Connect pressure refueling tube to pressure refueling interconnect tube. **HANDTIGHTEN NUT**. Connect bonding jumper on pressure refueling interconnect tube to clamp on pressure refueling tube with screw, washers, and nut.

- Lubricate MS29513-243 packing with petrolatum, Fed. Spec VV-P-236. Install packing on gravity fill adapter unit. With directional arrow pointing to front of helicopter, bolt gravity fill adapter unit and bonding jumper to fuel cell. **TORQUE BOLTS TO 43 - 48 INCH-POUNDS.**

- Put a bead of sealant, MIL-S-8802, in cavity between gravity fill adapter unit and refueling panel, and pressure refueling receptacle and pressure refueling panel.

- Lubricate packing, MS29513-224, with petrolatum, Fed. Spec VV-P-236. Install packing in groove on sump drain valve. Coat threads on drain attachment bolts with anti-seize compound, MIL-A-907. Bolt sump drain valve to fuel cell. **TORQUE BOLTS TO 43 - 48 INCH-POUNDS.**

- Make sure fuel cells are clean and free of all dirt, rags and tools. Remove UHF antenna protective cover in transition section tube.

- Lubricate packings, MS29513-281, with petrolatum, Fed. Spec VV-P-236. Install packings on fuel cell access covers. Coat threads of access cover attachment bolts with anti-seize compound, MIL-A-907. Bolt access covers to fuel cells with washers and bolts. **TORQUE BOLTS TO 43 - 48 INCH-POUNDS.**

STEP 2 INSTALL FUEL CELL (CONT)

- Pressure test fuel cells (TASK 18).
- Do a fuel quantity indicating system adjustment (TM 55-1520-237-23-9).
- Check area to be sure it is free of foreign objects, then install front and top panel with washers and screws.
- Check area to be sure it is free of foreign objects, then install left and right panels enclosing fuel system components. Lock fastener studs.
- On UH-60A helicopters, do this:
  - Hook cargo netting in aft section stowage compartment access opening.
  - Install soundproofing.
  - Install troop seats (TM 55-1520-237-23-5).
- On EH-60A helicopters install supply ducting, condenser pallet, evaporator pallet, and plenum (TM 55-1520-237-23-5).
- Refuel fuel cells (TASK 11).
- Prime fuel system (TASK 12).

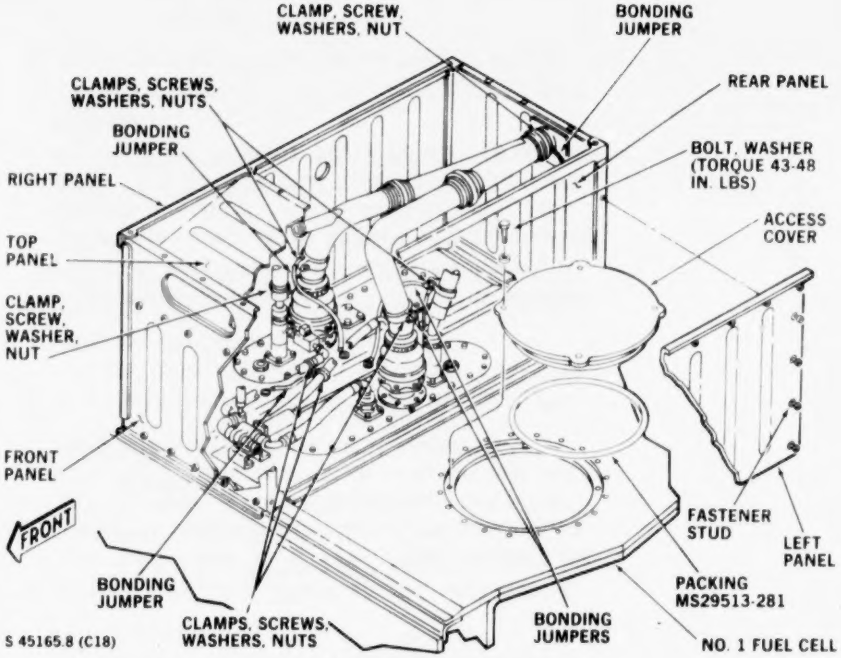

CLAMP, SCREW, WASHERS, NUT
BONDING JUMPER
REAR PANEL
CLAMPS, SCREWS, WASHERS, NUTS
BONDING JUMPER
BOLT, WASHER (TORQUE 43-48 IN. LBS)
RIGHT PANEL
ACCESS COVER
TOP PANEL
CLAMP, SCREW, WASHER, NUT
FRONT PANEL
FRONT
FASTENER STUD
LEFT PANEL
PACKING MS29513-281
BONDING JUMPER
CLAMPS, SCREWS, WASHERS, NUTS
BONDING JUMPERS
NO. 1 FUEL CELL
S 45165.8 (C18)

Figure 15-2 (Sheet 8 of 8)

STEP 3 PRESERVE FUEL CELL

FUEL CELL INSTALLED IN HELICOPTER

NOTE

Fuel cells installed in a helicopter that is being stored for less than 30 days require no special procedures. The following procedures apply if fuel cells are to remain drained for longer than 30 days.

- Turn off all electrical power.
- Defuel fuel cells (TASK 11).
- Drain fuel cell sump (TASK 11).
- On UH-60A helicopters, do this:
  - Remove troop seats from rear cabin (TM 55-1520-237-23-5).
  - Remove soundproofing from left and right stowage compartments and center structure in cabin midsection.
  - Unhook cargo netting to get into compartments.
- On EH-60A helicopters remove plenum, evaporator pallet, condenser pallet and supply ducting (TM 55-1520-237-23-5).
- Unbolt and remove access covers from both fuel cells. Remove packings from covers.
- Purge fuel cell of fumes (TM 55-1500-204-25/1).
- Apply a light coating of No. 10 weight engine oil, MIL-L-22851 or equivalent, to inside surfaces of each fuel cell.

NOTE

When coating cells, make sure that all puddled or pooled oil is removed immediately.

- Lubricate packings, MS29513-281, with petrolatum, Fed. Spec VV-P-236. Install packings on access covers.

STEP 3 PRESERVE FUEL CELL (CONT)

- Coat threads of bolts with antiseize compound, MIL-A-907. Bolt access covers to fuel cells. **TORQUE BOLTS TO 43 - 48 INCH-POUNDS.**
- Hook cargo netting in aft section stowage compartment access openings.
- Check area for cleanness and foreign objects.
- Install soundproofing.
- Install troop seats (TM 55-1520-237-23-5).

FUEL CELL NOT INSTALLED IN HELICOPTER

- For fuel cell removed from helicopter for return to depot for repair, do this:
  - Purge thoroughly with fresh air.
  - Scrub with warm soapy water.
  - Rinse in clean, clear water.
  - Allow to air-dry.
- If fuel cell is to be stored for longer than 1 week, do this:
  - Spray or swab a light coating of No. 10 weight engine oil, Fed. Spec MIL-L-22851 or equivalent, to inside surface of fuel cell.

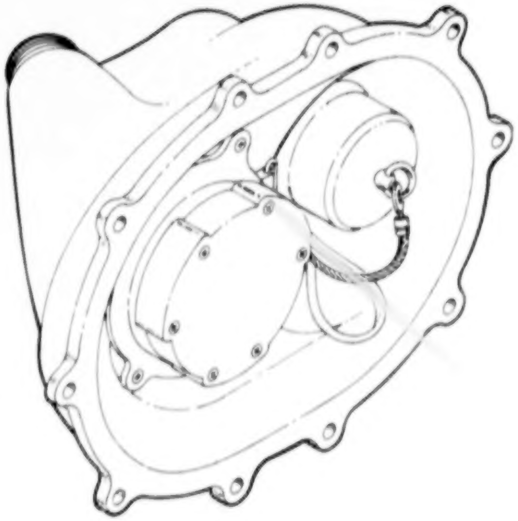
NOTE

When coating cell, make sure all puddled or pooled oil is removed immediately.

TASK 16

REFUELING RECEPTACLE - REPLACE

- **REPLACE PRESSURE REFUELING RECEPTACLE - STEP 1**
- **REPLACE REFUEL ADAPTER AND NIPPLE - STEP 2**



S 45213 (C4)

PERSONNEL REQUIRED

- One Person Required: MOS 67T - Tactical Transport Helicopter Repairer

SUPPLIES

- Antiseize Compound, MIL-A-907, NSN 8030-00-597-5367 (STEP 1)
- Packing, MS29513-137 (1 Required) (STEP 2)
- Packing, MS29513-153 (1 Required) (STEP 2)
- Packing, MS29513-222 (1 Required) (STEP 1)
- Packing, MS29513-276 (1 Required) (STEP 1)
- Packing, MS29513-281 (1 Required) (STEP 1)
- Petrolatum, Fed. Spec VV-P-236, NSN 9150-00-250-0926 (STEPS 1, 2)
- Sealing Compound, MIL-S-8802 (STEP 1)

TOOLS

- Aircraft Mechanic's Toolkit, NSN 5180-00-323-4692
- Torque Wrench 30 - 150 in. lbs, NSN 5120-00-542-4489

ALSO NEEDED

- TASK 11
- TASK 12
- TASK 18
- TM 55-1500-204-25/1 (STEPS 1 and 2)
- TM 55-1520-237-23-5 (STEP 1)
- TM 55-1520-237-23-6 (STEP 1)

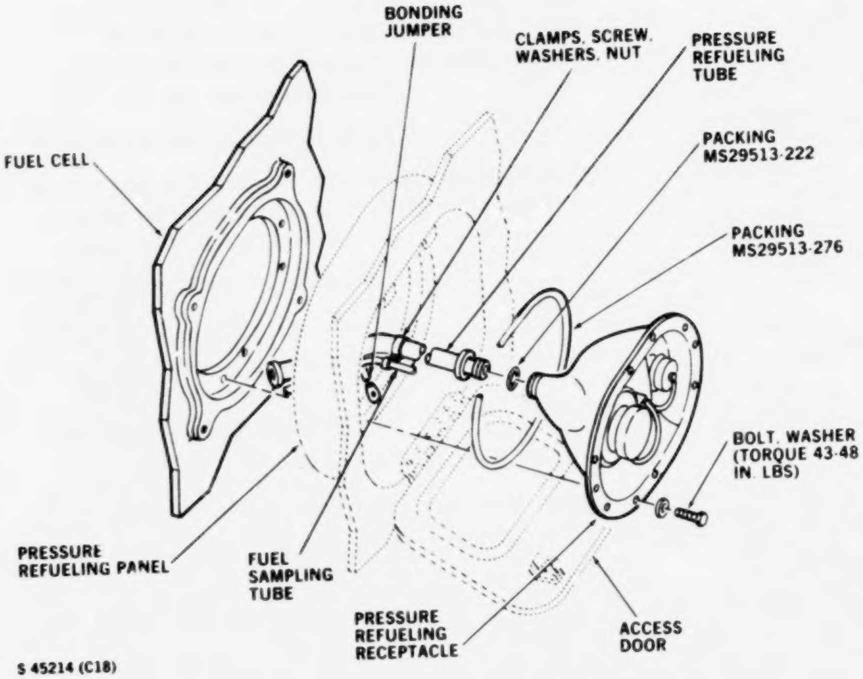
STEP 1 REPLACE PRESSURE REFUELING RECEPTACLE

DEFUEL

- Turn off all electrical power.
- Defuel fuel cells (TASK 11).
- Drain fuel cell sump (TASK 11).
- Purge fuel cell of vapors (TM 55-1500-204-25/1).

REMOVE

- Deleted.
- On UH-60A helicopters, do this:
  - Remove troop seats from midsection rear cabin (TM 55-1520-237-23-5).
  - Remove soundproofing from left stowage compartment in cabin midsection.
  - Unhook cargo netting to get into compartment.
- On EH-60A helicopters, do this:
  - For access to No. 1 fuel cell, remove evaporator pallet (TM 55-1520-236-23-6).


BONDING JUMPER
CLAMPS, SCREW, WASHERS, NUT
PRESSURE REFUELING TUBE
PACKING MS29513-222
FUEL CELL
PACKING MS29513-276
BOLT, WASHER (TORQUE 43-48 IN. LBS)
PRESSURE REFUELING PANEL
FUEL SAMPLING TUBE
PRESSURE REFUELING RECEPTACLE
ACCESS DOOR

S 45214 (C18)

Figure 16-1

STEP 1 REPLACE PRESSURE REFUELING RECEPTACLE (CONT)

- Unbolt and remove access cover from fuel cell. Remove packing from cover.
- Disconnect pressure refueling tube from pressure refueling receptacle.
- Unbolt and remove receptacle from fuel cell.
- Remove packings from receptacle and pressure refueling tube.
- Remove old sealing compound from pressure refueling receptacle and panel.

INSTALL

- Lubricate packing, MS29513-276, with petrolatum, Fed. Spec VV-P-236.
- Install packing in groove on pressure refueling receptacle.

STEP 1 REPLACE PRESSURE REFUELING RECEPTACLE (CONT)

- Lubricate packing, MS29513-222, with petrolatum, Fed. Spec VV-P-236.
- Install packing on end of pressure refueling tube.
- Coat threads of pressure refueling receptacle bolts with antiseize compound, MIL-A-907. Bolt pressure refueling receptacle and bonding jumper to fuel cell. **TORQUE BOLTS TO 43 - 48 INCH-POUNDS.**
- Deleted.
- Coat threads on pressure refueling receptacle with antiseize compound, MIL-A-907. Connect pressure refueling tube to pressure refueling receptacle.
- Deleted.
- Lubricate packing, MS29513-281, with petrolatum, Fed. Spec VV-P-236. Install packing on fuel cell access cover. Coat threads of access cover attachment bolts with antiseize compound, MIL-A-907. Check area for foreign objects. Bolt access cover to fuel cell with washers and bolts. **TORQUE BOLTS TO 43 - 48 INCH-POUNDS.**
- Pressure test fuel cells (TASK 18).
- Put a bead of sealing compound, MIL-S-8802, in cavity between pressure refueling receptacle and pressure refueling panel.
- Check area for foreign objects.
- On UH-60A helicopters, do this:
  - Hook cargo netting in stowage compartment access opening.
  - Install soundproofing.
  - Install troop seats (TM 55-1520-237-23-5).
- On EH-60A helicopters, do this:
  - Install evaporator pallet (TM 55-1520-237-23-5).
- Refuel fuel cells (TASK 11).
- Prime fuel system (TASK 12).

STEP 2 REPLACE REFUEL ADAPTER AND NIPPLE

DEFUEL

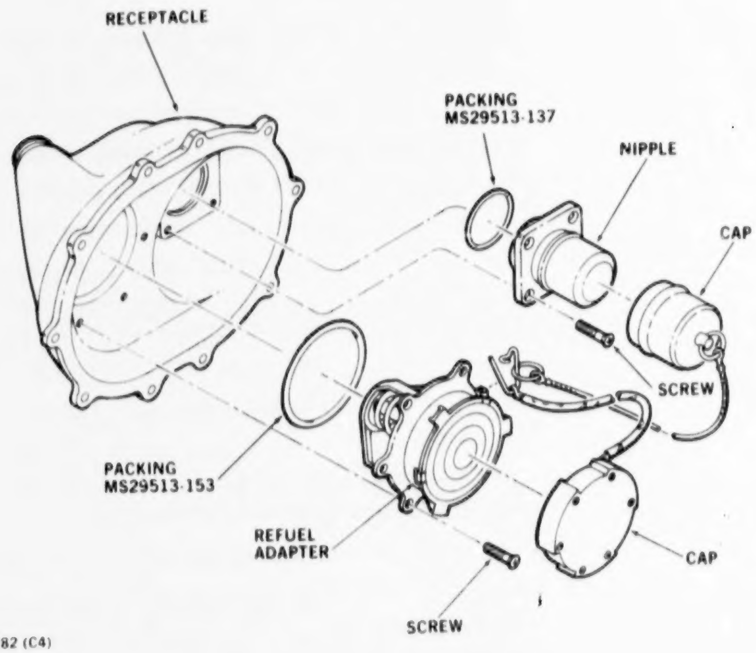
- Turn off all electrical power.
- Defuel fuel cells (TASK 11).
- Drain fuel cell sump (TASK 11).
- Purge fuel cell of fumes (TM 55-1500-204-25/1).

REMOVE REFUEL ADAPTER

- Remove cap from refuel adapter.
- Remove screws, refuel adapter from pressure refueling receptacle.
- Discard packing.

REMOVE NIPPLE

- Remove cap from nipple.
- Remove screws, nipple from pressure refueling receptacle.
- Discard packing.


RECEPTACLE
PACKING
MS29513-137
NIPPLE
CAP
SCREW
PACKING
MS29513-153
REFUEL
ADAPTER
CAP
SCREW

S 57282 (C4)

Figure 16-2

STEP 2 REPLACE REFUEL ADAPTER AND NIPPLE (CONT)

INSTALL REFUEL ADAPTER

- Lubricate packing, MS29513-153, with petrolatum, Fed. Spec VV-P-236.
- Install packing in groove on refuel adapter.
- Install refuel adapter in pressure refueling receptacle with screws.
- Place cap on refuel adapter.

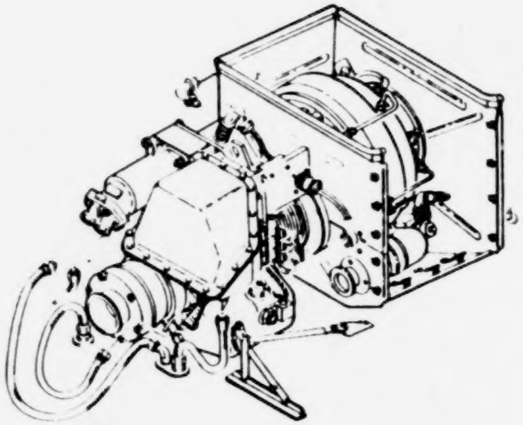
INSTALL NIPPLE

- Lubricate packing MS29513-137, with petrolatum, Fed. Spec VV-P-236.
- Install packing in groove on nipple.
- Install nipple in pressure refueling receptacle with screws.
- Place cap on nipple.
- Refuel fuel cells (TASK 11).
- Prime fuel system (TASK 12).

TASK 17

AUXILIARY POWER UNIT (APU) FUEL SYSTEM - MAINTAIN

- **PRIME APU FUEL LINE - STEP 1**
- **REPLACE FUEL SHUTOFF VALVE - STEP 2**



S 45166 (B)

PERSONNEL REQUIRED

- Two People Required: MOS 67T - Tactical Transport Helicopter Repairer
  Assistant

SUPPLIES

- Antiseize Compound, MIL-A-907, NSN 8030-00-597-5367 (STEP 2)
- Protective Plug (STEP 2)

TOOLS

- Aircraft Mechanic's Toolkit, NSN 5180-00-323-4692

ALSO NEEDED

- Rags (STEPS 1, 2)
- TM 55-1520-237-23-3 (STEP 2)
- TM 55-1520-237-23-5 (STEP 2)

STEP 1 PRIME APU FUEL LINE

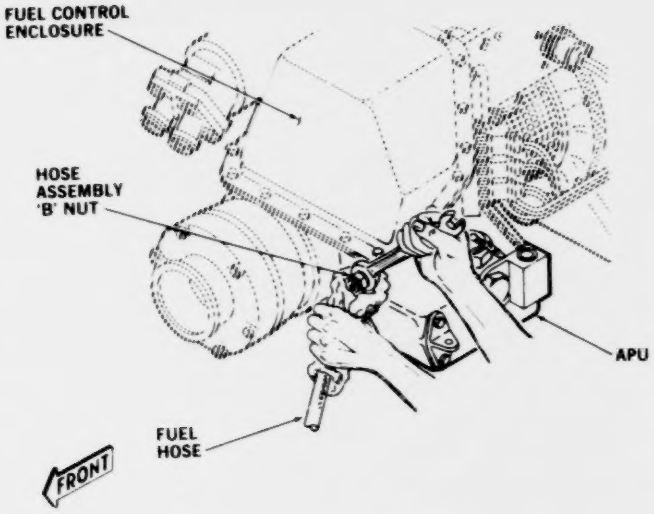
PRIME

- Hinge open APU compartment door.
- Loosen B-nut on fuel hose at fuel control enclosure inlet enough to let fuel leak when priming fuel line.
- Place BATT switch on upper console ON, or connect external electrical power to helicopter.

WARNING

To prevent injury to personnel or damage to equipment, make sure APU T-handle on upper console is not pulled out.

- Hold rag around fuel hose B-nut. Have assistant place FUEL PUMP switch on upper console in cockpit to APU BOOST. When fuel leaks from B-nut, tighten B-nut and place FUEL PUMP switch OFF.



S 45167 (B)

Figure 17-1

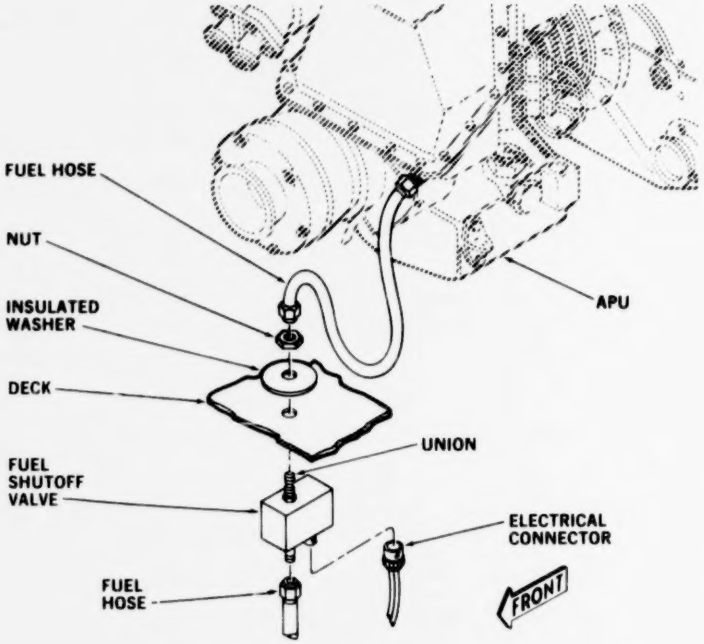
STEP 1 PRIME APU FUEL LINE (CONT)

- Place BATT switch on upper console OFF, or disconnect external electrical power from helicopter.
- Check area to insure it is free of foreign objects then close and latch APU compartment door.

STEP 2 REPLACE FUEL SHUTOFF VALVE

REMOVE

- On UH-60A helicopters, do this:
  - Remove troop seats from rear cabin (TM 55-1520-237-23-5).
  - Remove soundproofing blanket from right stowage compartment in cabin midsection.
  - Unhook cargo netting to get into compartment.
- On EH-60A helicopters, do this:
  - Remove right panel on rear cabin bulkhead (TM 55-1520-237-23-5).
  - Remove access panel on right panel enclosing fuel system components.
- Unlock fastener studs holding right panel enclosing fuel system components on top of fuel cells. Remove panel from compartment.
- Turn off all electrical power.
- Disconnect electrical connector from fuel shutoff valve.


FUEL HOSE
NUT
INSULATED WASHER
DECK
FUEL SHUTOFF VALVE
FUEL HOSE
APU
UNION
ELECTRICAL CONNECTOR
FRONT

S 45168 (B)

Figure 17-2

STEP 2 REPLACE FUEL SHUTOFF VALVE (CONT)

- Disconnect fuel hose from fuel shutoff valve, and plug hose.
- Hinge open APU compartment door.
- Place some rags on transition deck around fuel hose. Disconnect fuel hose from shutoff valve union protruding through deck. Plug fuel hose.
- With assistant inside helicopter holding fuel shutoff valve, remove nut, insulated washer, and valve from transition deck.

INSTALL

- Fasten fuel shutoff valve to transition deck with insulated washer and nut, using assistant to hold valve in place.
- Coat threads on fuel shutoff valve unions with antiseize compound, MIL-A-907.
- Unplug fuel hose and connect to fuel shutoff valve union.
- Connect fuel hose to fuel shutoff valve.
- Connect electrical connector to shutoff valve.
- Prime fuel line (STEP 1) and check for leaks.
- Do an operational check of fuel prime boost system (TM 55-1520-237-23-3).
- Remove rags from APU compartment.
- Check area to insure it is free of foreign objects then close and latch APU compartment door.
- Check area to insure it is free of foreign objects then install right panel enclosing fuel system components. Lock fastener studs.
- On UH-60A helicopters, do this:
  - Hook cargo netting in stowage compartment access opening.
  - Install soundproofing blanket.
  - Install troop seats (TM 55-1520-237-23-5).
- On EH-60A helicopters, do this:
  - Install access panel on right panel enclosing fuel system components.
  - Install right panel on rear cabin bulkhead (TM 55-1520-237-23-5).

TASK 18

FUEL SYSTEM - PRESSURE TEST

- **PRESSURE TEST FUEL CELLS - STEP 1**

PERSONNEL REQUIRED

- One Person Required: MOS 67T - Tactical Transport Helicopter Repairer

SUPPLIES

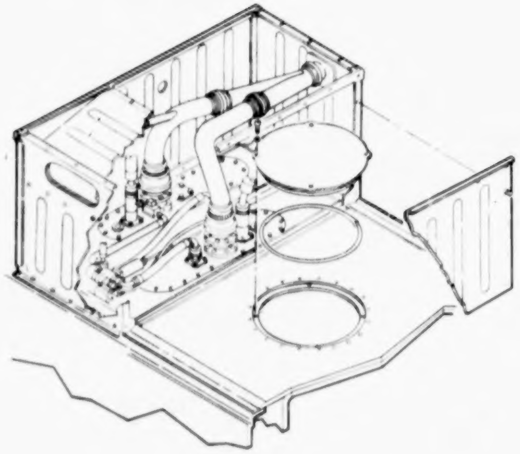
- Packing, MS29512-6 (2 Required)
- Seal, MS27195-40 (2 Required)

TOOLS

- Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
- Manometer, NSN 6685-00-526-8646, or equivalent
- Oil/Water Separator, NSN 4940-00-242-4101, or equivalent

ALSO NEEDED

- Elbow, AN837-6D (2 Required)
- Nut, AN6289-6D (2 Required)
- Protective Caps and Plugs
- TASK 11
- TASK 14

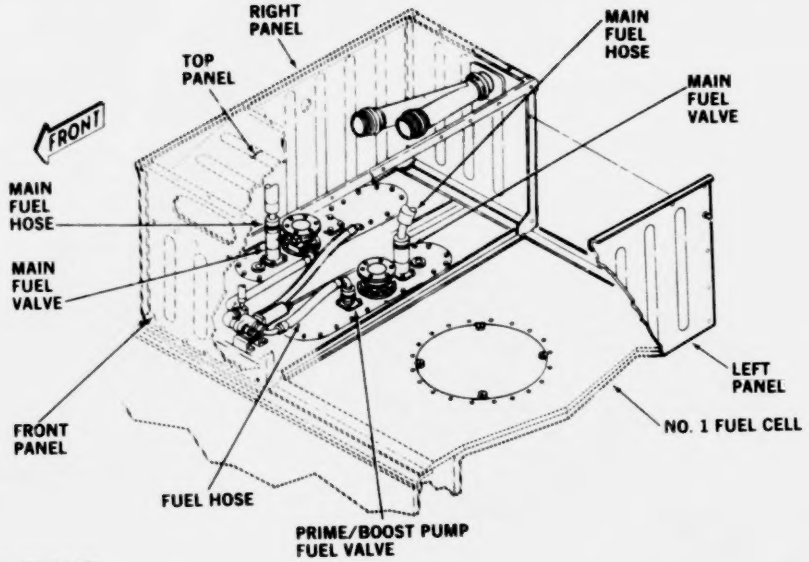


S 45169 (B)

STEP 1 PRESSURE TEST FUEL CELLS

PREPARE TO TEST

- Turn off all electrical power.
- Defuel fuel cells and drain fuel cell sumps (TASK 11).
- Remove system vent valves from both fuel cells (TASK 14).
- Disconnect and plug fuel hose from prime/boost pump fuel valve on top of fuel cell. Cap valve.
- Disconnect and plug No. 1 and No. 2 fuel cell main fuel hose from main fuel valves and cap main fuel valves.
- Locally make two plates with elbows installed as shown.
- Install plates and seals, MS27195-40, on self-sealing breakaway vent valves with bolts, washers, and nuts used to install system vent valves.


RIGHT PANEL
TOP PANEL
MAIN FUEL HOSE
MAIN FUEL VALVE
FRONT
MAIN FUEL HOSE
MAIN FUEL VALVE
LEFT PANEL
NO. 1 FUEL CELL
FRONT PANEL
FUEL HOSE
PRIME/BOOST PUMP FUEL VALVE

S 45170.1 (B)

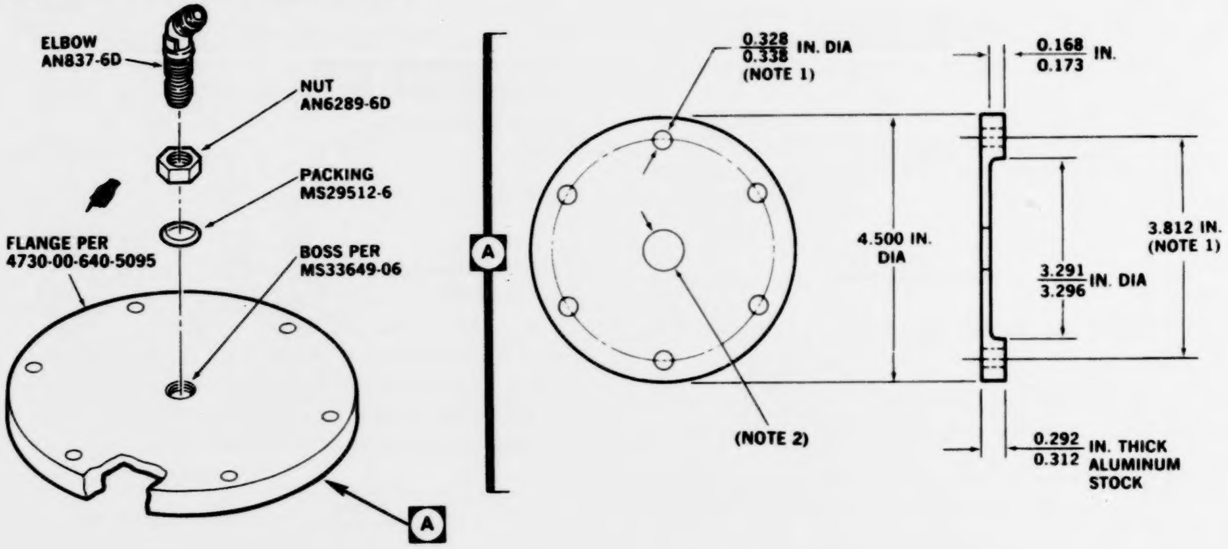
Figure 18-1 (Sheet 1 of 3)

STEP 1 PRESSURE TEST FUEL CELLS (CONT)

CONNECT TEST EQUIPMENT

- Close inlet and regulator valve on oil/water separator or equivalent.
- Connect air source to oil/water separator inlet valve.

STEP 1 PRESSURE TEST FUEL CELLS (CONT)


ELBOW
AN837-6D
NUT
AN6289-6D
PACKING
MS29512-6
FLANGE PER
4730-00-640-5095
BOSS PER
MS33649-06
A
A
0.328
0.338 IN. DIA
(NOTE 1)
0.168
0.173 IN.
4.500 IN.
DIA
3.812 IN.
(NOTE 1)
3.291
3.296 IN. DIA
(NOTE 2)
0.292
0.312 IN. THICK
ALUMINUM
STOCK

NOTES

1. SIX HOLES ARE REQUIRED, EQUALLY SPACED 60° APART
2. THREAD SIZE IS 0.5625-18

S 45170.2

Figure 18-1 (Sheet 2 of 3)

STEP 1 PRESSURE TEST FUEL CELLS (CONT)

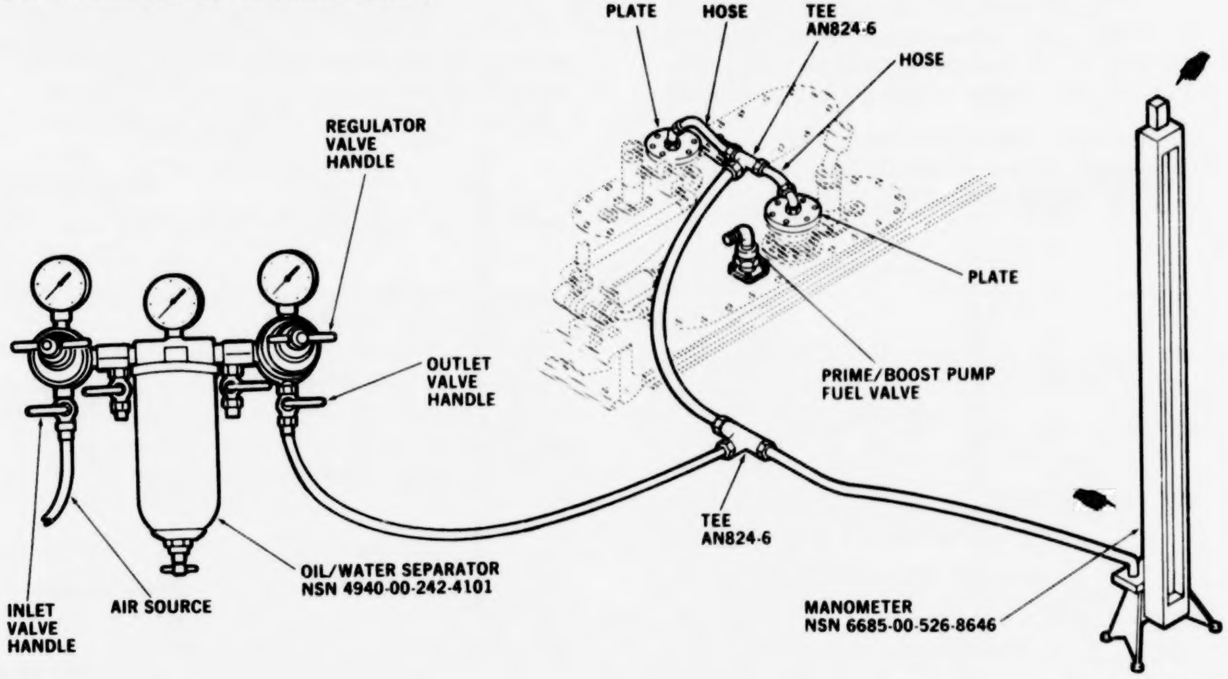


PLATE
HOSE
TEE
AN824-6
HOSE
REGULATOR
VALVE
HANDLE
PLATE
OUTLET
VALVE
HANDLE
PRIME/BOOST PUMP
FUEL VALVE
TEE
AN824-6
OIL/WATER SEPARATOR
NSN 4940-00-242-4101
MANOMETER
NSN 6685-00-526-8646
INLET
VALVE
HANDLE
AIR SOURCE
S 45170.3

Figure 18-1 (Sheet 3 of 3)

STEP 1 PRESSURE TEST FUEL CELLS (CONT)

- Connect a double-teed hose assembly to oil/water separator outlet valve, plates, and manometer, NSN 6685-00-526-8646, or equivalent, as shown.

TEST CELLS

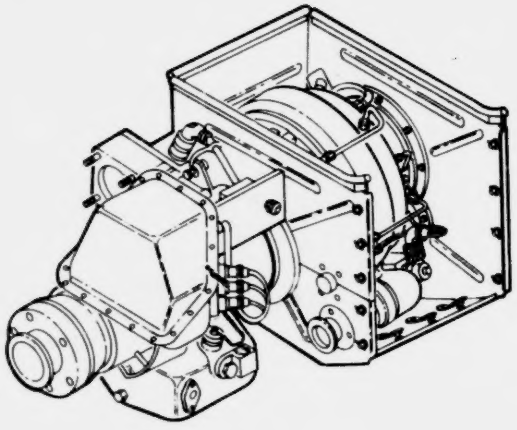
- Open inlet and outlet valves on oil/water separator.
- Slowly open regulator valve on oil/water separator until valve reads 0.5 psig. When manometer scale reads 13.8 inches H_2O, close outlet valve. After 15-minute period, look at manometer scale to see if dimension has decreased, indicating a pressure leak. **GREATEST ALLOWABLE PRESSURE DECREASE IS 1/8 INCH ON MANOMETER SCALE FOR 15-MINUTE PERIOD.**
- Open outlet valve on oil/water separator.
- Slowly open regulator valve until valve reads 1 psig. When manometer scale reads 27.67 inches H_2O, close outlet valve. After 15-minute period, look at manometer scale to see if dimension has decreased, indicating a pressure leak. **GREATEST ALLOWABLE PRESSURE DECREASE IS 1/8 INCH ON MANOMETER SCALE FOR 15-MINUTE PERIOD.**
- If leakage is beyond that stated, check caps on refueling posts for proper seating, and all line and hose connections. Retest fuel cells for allowable pressure.

AFTER TESTING

- Disconnect air source and remove test equipment from plates, manometer, and oil/water separator.
- Remove plates from self-sealing breakaway vent valves and install system vent valves (TASK 14).
- Uncap main fuel valves and connect No. 1 and No. 2 fuel cell main fuel hoses to valves.
- Uncap prime/boost pump fuel valve.
- Unplug and connect fuel hose to prime/boost pump fuel valve on top of fuel cell.

TASK 19
AUXILIARY POWER UNIT (APU) - REMOVE/INSTALL/SERVICE

- **REMOVE APU - STEP 1**
- **INSTALL APU - STEP 2**
- **SERVICE APU - STEP 3**
- **PRESERVE/DEPRESERVE APU - STEP 4**



545171 (B)

PERSONNEL REQUIRED

- Three People Required: MOS 67T - Tactical Transport Helicopter Repairer
  Assistants Required (STEPS 1, 2)

SUPPLIES

- Antiseize Compound, MIL-A-907, NSN 8030-00-597-5367 (STEP 2)
- Gasket, MS9136-01 (STEP 2)
- Grease, MIL-G-81827, NSN 9150-00-408-9635 (STEP 2)
- Lockwire, MS20995NC32 (STEP 2)
- Lockwire, MS20995NC20 (STEP 2)
- Lubricating Oil, MIL-L-23699 or Lubricating Oil, MIL-L-7808 (STEP 3)
- Packing, NAS 1595-6 (STEP 2)
- Saddle Washer, NSN 5310-01-096-5623 (STEP 2)
- Sealing Compound, RTV106, NSN 8040-00-902-3871 (STEP 2)
- Sealing Compound, MIL-S-8802, NSN 8030-00-723-2746 (STEP 2)

TOOLS

- Adapter Assembly, 70700-20423-041 (STEPS 1, 2)
- Aircraft Mechanic's Toolkit, NSN 5180-00-323-4692

TOOLS (CONT)

- Engine and Powertrain Repairman's Toolkit, NSN 5180-00-323-4944
- Hoist, to Support Weight of APU (150 lbs.) (STEPS 1, 2)
- Hoisting Sling Assembly, 70700-20323-041 (STEPS 1, 2)
- Maintenance Crane, 70700-20300-042 (Alternate For Hoist) (STEPS 1, 2)
- Maintenance Trailer NSN 1730-00-435-7818 (STEPS 1, 2)
- Torque Wrench, 0 - 30 in. lbs, NSN 5120-00-117-4832 (STEP 2)
- Torque Wrench, 30 - 150 in. lbs, NSN 5120-00-542-4489 (STEP 2)
- Torque Wrench, 150 - 750 in. lbs, NSN 5120-00-821-3441 (STEP 2)

ALSO NEEDED

- 1-Gallon Container (STEP 2)
- Protective Plugs (STEP 1)
- Tags (STEP 1)
- TASK 17 (STEP 2)
- TM 55-1520-237-23-3 (STEP 2)
- TM 55-1520-237-23-4 (STEPS 2, 4)
- TM 55-1520-237-23-5 (STEPS 1, 2)

STEP 1 REMOVE APU

REMOVE

- If removing APU for storage or AVIM level maintenance, preserve APU (STEP 4).
- If maintenance crane, 70700-20300-042, is to be used, assemble and set up crane (TM 55-1520-237-23-4).
- Turn off all electrical power.
- Remove APU compartment doors from helicopter.
- Unclamp generator wiring from airframe.
- Disconnect electrical connector from fire detector on rear panel.
- Loosen stud fasteners, or remove screws, securing fuel control cover to fuel control base. Remove cover.

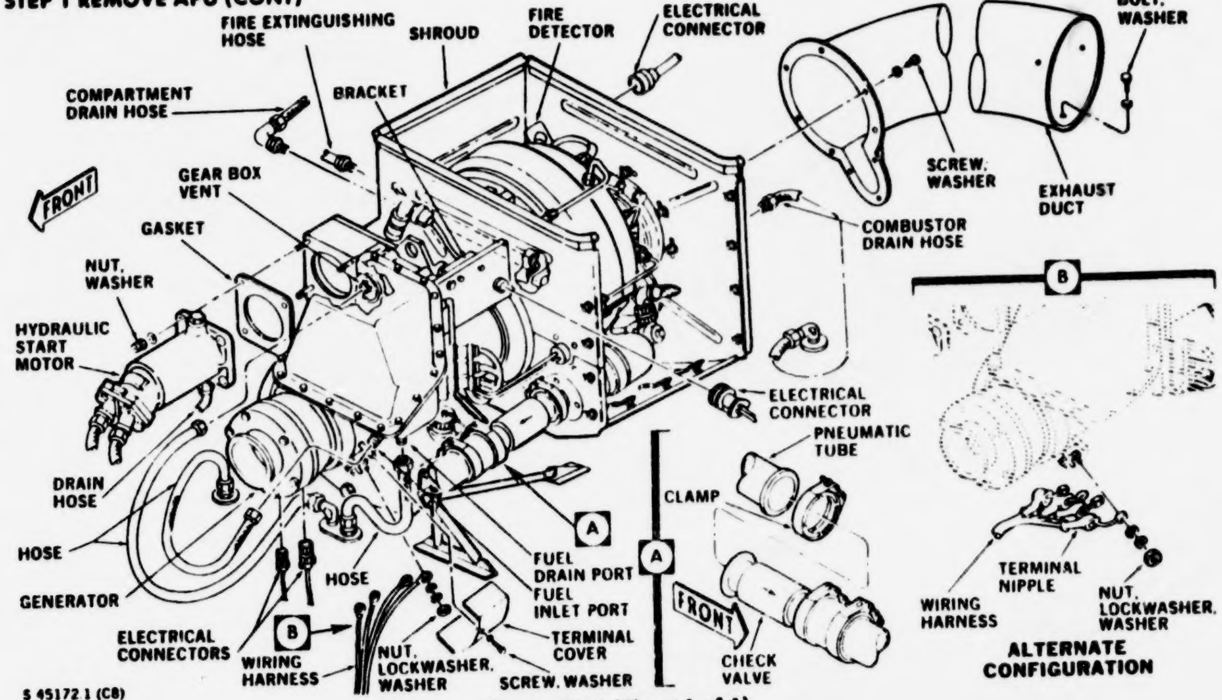
CAUTION

To avoid damage to fuel filter, union inside fuel control base must be held with a wrench when disconnecting fuel inlet hose.

- Holding union inside base with a wrench, disconnect fuel inlet hose.
- Disconnect hoses from drain ports, gear box vent, compartment drain, combustor drain, and fire extinguishing hose. Plug hoses and cover ports.

- Remove nuts, washers, hydraulic start motor, and gasket from APU.
- Tie hydraulic start motor to beam. Make sure hoses are not kinked.
- Disconnect electrical connectors from generator and bracket.
- Remove screws holding exhaust duct to shroud. Remove bolts holding exhaust duct to airframe fairing.
- Unclamp check valve from pneumatic tube at front panel half firewall.
- If new APU is to be installed, install fuel control cover on fuel control base. Lock and secure cover with stud fasteners or screws.

STEP 1 REMOVE APU (CONT)


FIRE EXTINGUISHING HOSE
SHROUD
FIRE DETECTOR
ELECTRICAL CONNECTOR
BOLT, WASHER
COMPARTMENT DRAIN HOSE
BRACKET
FRONT
GEAR BOX VENT
GASKET
NUT, WASHER
HYDRAULIC START MOTOR
SCREW, WASHER
EXHAUST DUCT
COMBUSTOR DRAIN HOSE
B
ELECTRICAL CONNECTOR
PNEUMATIC TUBE
CLAMP
A
A
DRAIN HOSE
HOSE
GENERATOR
HOSE
ELECTRICAL CONNECTORS
B
WIRING HARNESS
NUT, LOCKWASHER, WASHER
SCREW, WASHER
TERMINAL COVER
FUEL DRAIN PORT
FUEL INLET PORT
FRONT
CHECK VALVE
WIRING HARNESS
TERMINAL NIPPLE
NUT, LOCKWASHER, WASHER
ALTERNATE CONFIGURATION

S 45172 1 (C8)

Figure 19-1 (Sheet 1 of 4)

STEP 1 REMOVE APU (CONT)

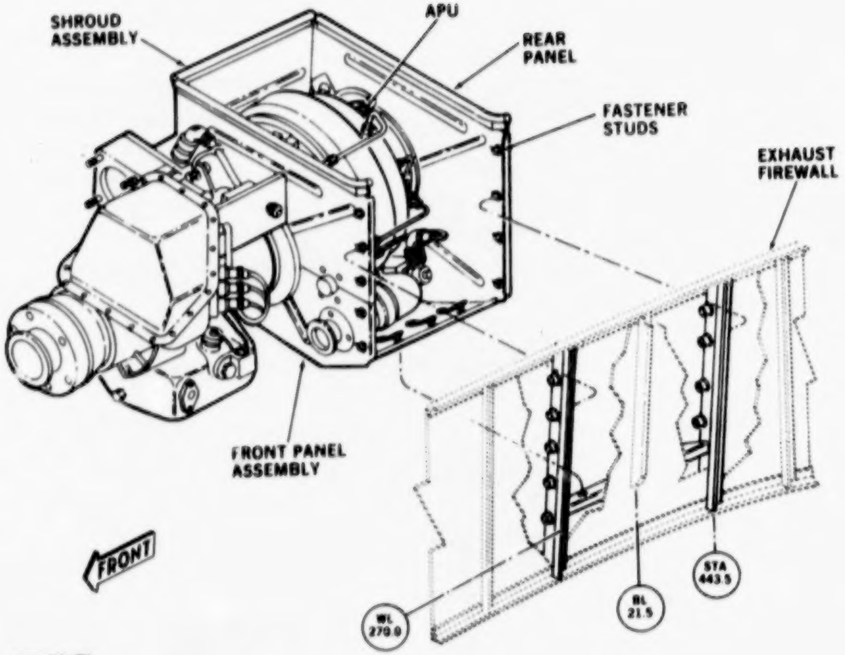
NOTE

APU shroud assembly is secured to engine exhaust firewall at station 443.5, waterline 270.0, buttline 21.5.

- Release fastener studs securing shroud assembly panels to exhaust firewall.

NOTE

Make sure APU (with shroud assembly) is separated from engine exhaust firewall.


SHROUD ASSEMBLY
APU
REAR PANEL
FASTENER STUDS
EXHAUST FIREWALL
FRONT PANEL ASSEMBLY
FRONT
WL 270.0
BL 21.5
STA 443.5

S 46172 (B)

Figure 19-1 (Sheet 2 of 4)

STEP 1 REMOVE APU (CONT)

- Install hoisting sling, 70700-20323-041, on APU. Attach sling to maintenance crane or to a hoist with enough capacity to lift APU (150 pounds). Take up slack.

WARNING

To prevent injury to personnel or damage to equipment, do not use crane as a source of excessive force to free APU from compartment. Make sure crane hook does not touch pulley when lifting APU, as this may damage the cable.

- Remove bolts securing forward mounting lugs to forward supports. Operate hoist/crane that will support full weight of APU.
- Slide APU to rear, disengaging aft mounting lug from aft support fitting. Raise APU up enough to disconnect generator wiring.

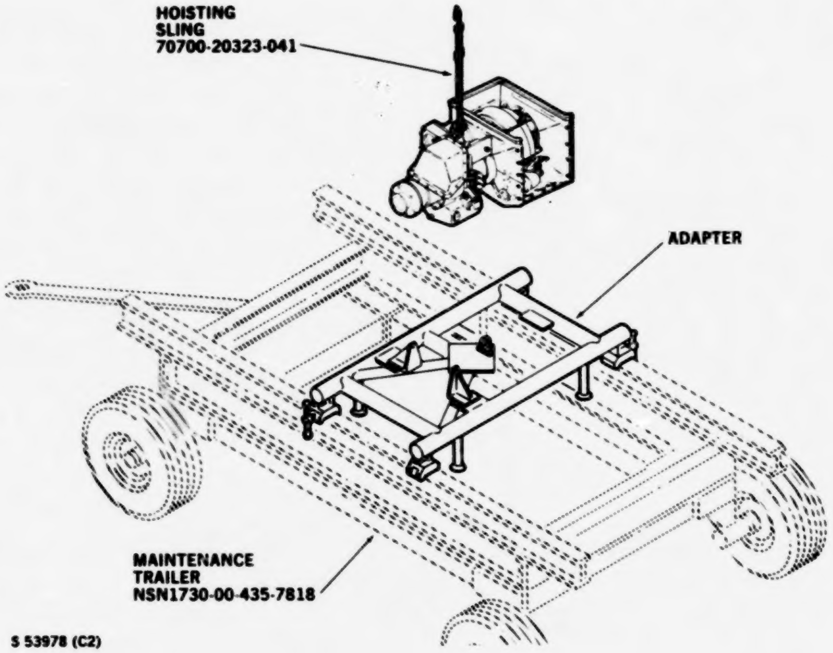

HOISTING SLING 70700-20323-041
ADAPTER
MAINTENANCE TRAILER NSN1730-00-435-7818
S 53978 (C2)

Figure 19-1 (Sheet 2.1 of 4)

STEP 1 REMOVE APU (CONT)

- If terminal cover is installed, remove it, or slide terminal nipples back on wiring harness leads. Tag and disconnect wiring harness leads from terminals on generator.

WARNING

To prevent injury to personnel or damage to equipment, do not use crane as a source of excessive force to free APU from helicopter. Make sure crane hook does not touch pulley when lifting APU from helicopter, as this may damage the cable.

- With assistant operating hoist/crane, remove APU from helicopter. Unbolt forward mounting lugs from APU gear box sump. Install on adapter assembly, 70700-20423-041, on maintenance trailer. If adapter assembly/maintenance trailer is not available, support APU to prevent damage to components on bottom of APU.

NOTE

If APU is being replaced because of internal failure, check pneumatic system for possible metal contamination. (TASK 5).

STEP 1 REMOVE APU (CONT)

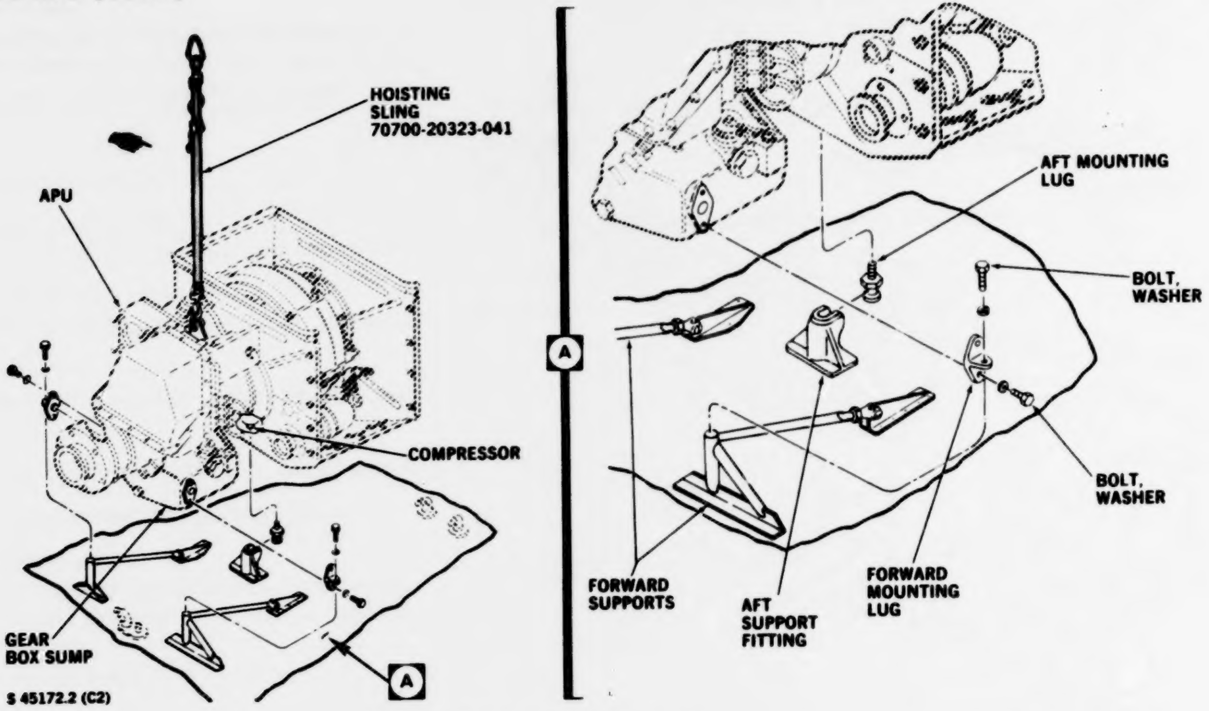

HOISTING SLING 70700-20323-041
APU
COMPRESSOR
GEAR BOX SUMP
A
S 45172.2 (C2)
A
AFT MOUNTING LUG
BOLT, WASHER
BOLT, WASHER
FORWARD SUPPORTS
AFT SUPPORT FITTING
FORWARD MOUNTING LUG

Figure 19-1 (Sheet 3 of 4)

STEP 1 REMOVE APU (CONT)

- Remove screws holding cover halves around bleed air outlet flange. Remove cover halves from lower front panel half.
- Remove bolts, washers, and firewall sleeves.
- Loosen band clamp holding front panel halves together.
- Unscrew and remove rear mounting lug from shroud assembly.
- Remove screws holding front panel halves to shroud. Remove front panel halves.
- Remove shroud assembly (with rear panel) surrounding APU hot section.
- Remove combustor drain.

NOTE

During a APU engine change involving the replacement of a 116305-100 engine with a 116305-200 engine keep the combustor drain line.

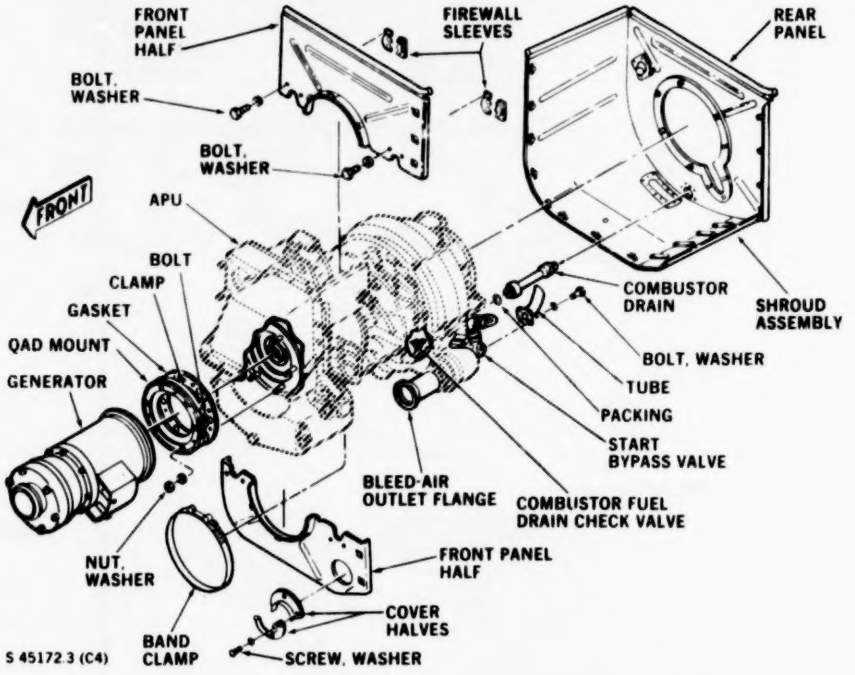

FRONT PANEL HALF
FIREWALL SLEEVES
REAR PANEL
BOLT, WASHER
BOLT, WASHER
FRONT
APU
BOLT
CLAMP
GASKET
QAD MOUNT
GENERATOR
COMBUSTOR DRAIN
SHROUD ASSEMBLY
BOLT, WASHER
TUBE
PACKING
START BYPASS VALVE
BLEED-AIR OUTLET FLANGE
COMBUSTOR FUEL DRAIN CHECK VALVE
FRONT PANEL HALF
NUT, WASHER
COVER HALVES
BAND CLAMP
SCREW, WASHER
S 45172.3 (C4)

Figure 19-1 (Sheet 4 of 4)

STEP 1 REMOVE APU (CONT)

- Remove packing from APU combustor fuel drain check valve. Cover port.
- Loosen clamp and remove exhaust pipe from APU.

NOTE

Deleted.

- Loosen clamp bolt on QAD mount clamp and remove generator from APU.
- Remove nuts, washers, QAD mount and gasket from APU.
- Unbolt tube from start bypass valve. Cover port.

STEP 2 INSTALL APU

INSTALL

- Depreserve APU (STEP 4).
- Place gasket, MS9136-01, and QAD mount on APU. Install with QAD mount bolt on left side of APU. Install washers and nuts. **TORQUE NUTS IN A CRISS-CROSS PATTERN TO 50 INCH-POUNDS; THEN TO 150 INCH-POUNDS; THEN TO 250 INCH-POUNDS; THEN TORQUE NUTS TO A FINAL TORQUE OF 261 - 289 INCH-POUNDS.**
- Install generator (TM 55-1520-237-23-9).

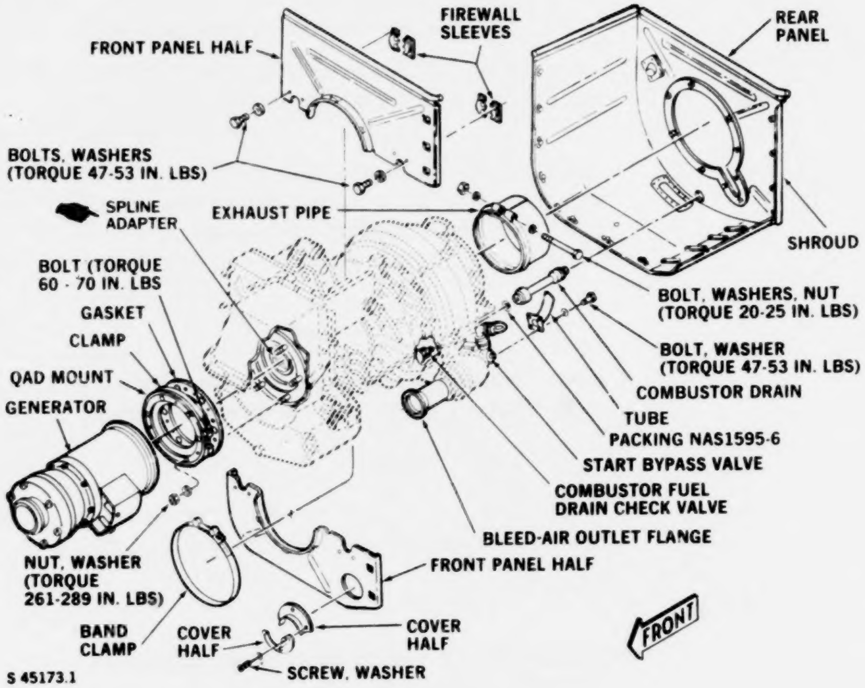

FRONT PANEL HALF
FIREWALL SLEEVES
REAR PANEL
BOLTS, WASHERS (TORQUE 47-53 IN. LBS)
SPLINE ADAPTER
EXHAUST PIPE
SHROUD
BOLT (TORQUE 60 - 70 IN. LBS
GASKET
CLAMP
QAD MOUNT
GENERATOR
BOLT, WASHERS, NUT (TORQUE 20-25 IN. LBS)
BOLT, WASHER (TORQUE 47-53 IN. LBS)
COMBUSTOR DRAIN
TUBE
PACKING NAS1595-6
START BYPASS VALVE
COMBUSTOR FUEL DRAIN CHECK VALVE
BLEED-AIR OUTLET FLANGE
FRONT PANEL HALF
NUT, WASHER (TORQUE 261-289 IN. LBS)
BAND CLAMP
COVER HALF
COVER HALF
SCREW, WASHER
FRONT
S 45173.1

Figure 19-2 (Sheet 1 of 5)

STEP 2 INSTALL APU (CONT)

- Remove port cover and bolt tube to start bypass valve. **TORQUE BOLTS TO 47 - 53 INCH-POUNDS.** Lockwire, MS20995NC32, bolts together.
- Apply a coat of antiseize compound, MIL-A-907, around inside clamping surface of exhaust pipe.
- Place exhaust pipe on flange of APU.
- Make sure exhaust pipe does not overlap APU exhaust case doubler. **TORQUE CLAMP BOLT TO 20 - 25 INCH-POUNDS.**
- Tap clamp lightly with nonmetallic hammer. **RETORQUE CLAMP BOLT TO 20 - 25 INCH-POUNDS.**
- Continue tapping clamp until two successive trials show no loss in torque.
- Remove port cover, and install packing, NAS 1595-6, on APU combustor fuel drain check valve.

STEP 2 INSTALL APU (CONT)

- Install shroud assembly (with rear panel) around APU hot section.
- Insert combustor drain through hole in rear panel. Thread drain onto APU combustor fuel drain check valve. Lockwire, MS20995NC20, drain to rear panel.

CAUTION

Make sure ignition lead, thermocouple lead, and wiring for valves and switches are positioned to prevent chafing and pinching when panel halves are installed.

- Place front panel halves on APU and fasten to each other by installing band clamp around front panel halves.
- Position leads and electrical wiring inside firewall sleeves, and install sleeves to front panel halves with bolts and washers. **TORQUE BOLTS TO 47 - 53 INCH-POUNDS**. Lockwire, MS20995NC32, bolts together.

NOTE

Lockwire bolts only on right side sleeves (looking forward).

STEP 2 INSTALL APU (CONT)

- Place cover halves around bleed air outlet flange, and fasten to lower front panel with washers and screws.
- Thread rear mounting lug into APU compressor. **TORQUE LUG TO 133 - 147 INCH-POUNDS**. Lockwire, MS20995NC20, lug to shroud assembly.
- Install hoisting sling, 70700-20323-041, on APU. Attach sling to hoist crane. Take up slack.

WARNING

To prevent injury to personnel or damage to equipment, do not use crane as a source of excessive force to free APU from engine adapter. Make sure crane hook does not touch pulley when lifting APU from adapter, as this may damage the cable.

- With assistants operating hoist/crane, support full weight of APU; then unbolt and disengage APU from adapter assembly, 70700-20423-041.
- Bolt front mounting lugs with top side up to APU gear box sump. **TORQUE BOLTS TO 104 - 116 INCH-POUNDS.**
- Raise APU up and lower into compartment enough to connect wiring to generator.
- Connect wiring harness leads to terminals on generator and remove tags. Install terminal nipples over terminals, or install terminal cover and lockwire, MS20995NC20, screws.
- Connect electrical connectors to generator and APU.
- Engage rear mounting lug in rear support fitting, and slide APU forward along engine exhaust firewall.

STEP 2 INSTALL APU (CONT)

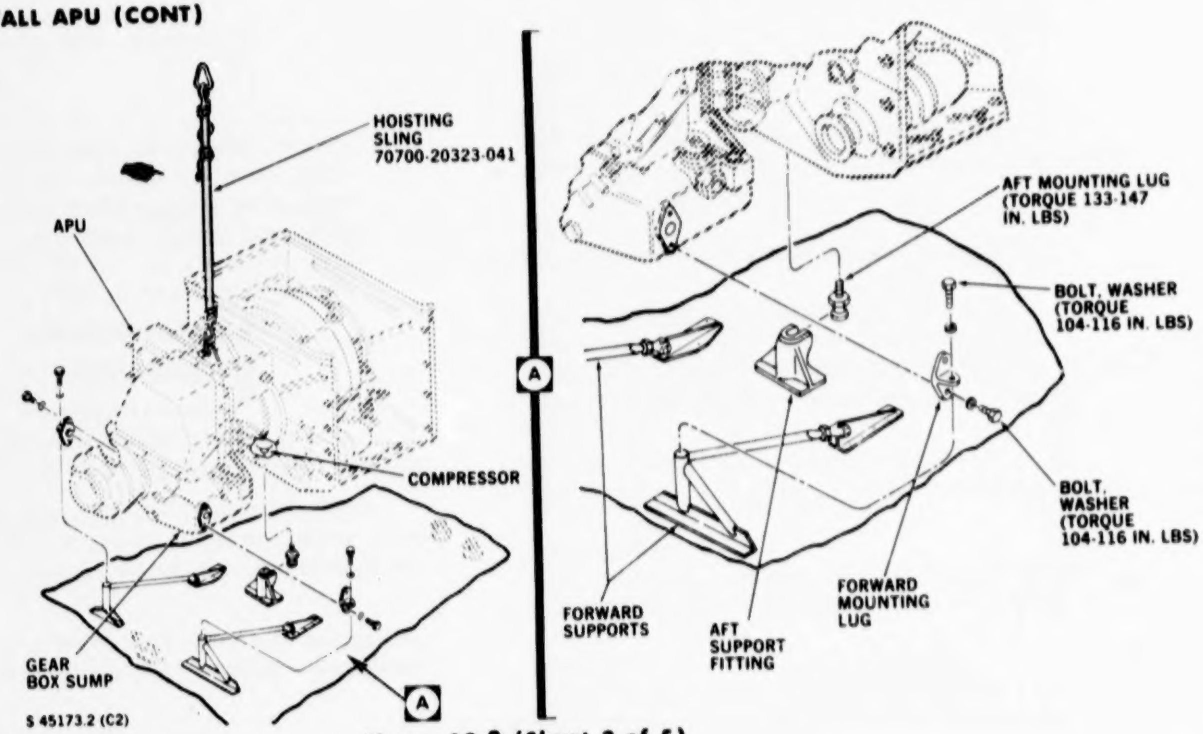
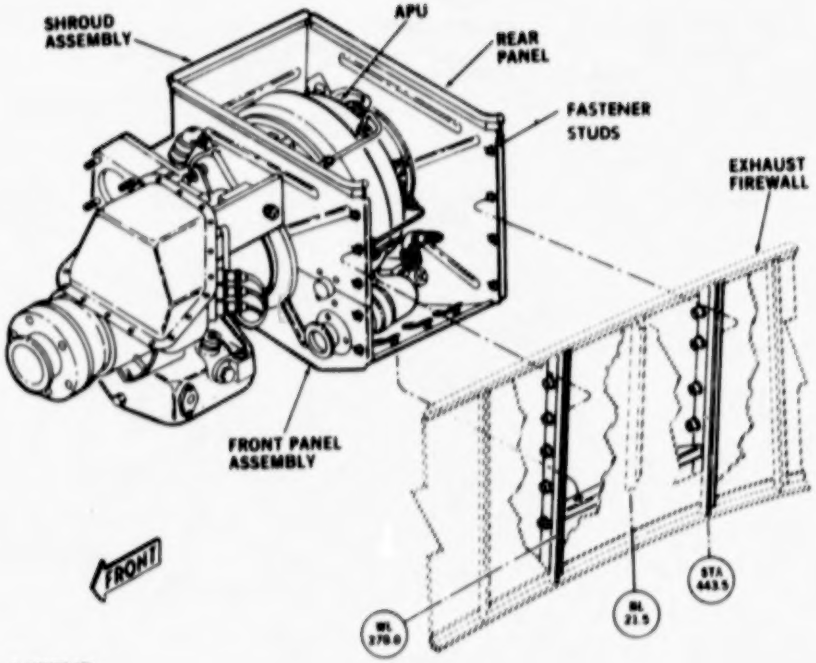

HOISTING SLING 70700-20323-041
APU
COMPRESSOR
GEAR BOX SUMP
A
A
S 45173.2 (C2)
AFT MOUNTING LUG (TORQUE 133-147 IN. LBS)
BOLT, WASHER (TORQUE 104-116 IN. LBS)
BOLT, WASHER (TORQUE 104-116 IN. LBS)
FORWARD SUPPORTS
AFT SUPPORT FITTING
FORWARD MOUNTING LUG

Figure 19-2 (Sheet 2 of 5)

STEP 2 INSTALL APU (CONT)

- Attach APU shroud assembly panels to exhaust firewall, and twist lock fastener studs.
- Bolt forward mounting lugs to forward supports. **TORQUE BOLTS TO 104-116 INCH-POUNDS.**


SHROUD ASSEMBLY
APU
REAR PANEL
FASTENER STUDS
EXHAUST FIREWALL
FRONT PANEL ASSEMBLY
FRONT
WL 270.0
BL 21.5
STA 443.5

S 46173 (B)

Figure 19-2 (Sheet 3 of 5)

STEP 2 INSTALL APU (CONT)

- Install exhaust duct on shroud rear panel flange with washers and screws.
- Attach exhaust duct to APU panel with bolts and washers, NSN 5310-01-096-5623. **TORQUE BOLTS TO 47 - 53 INCH-POUNDS.**
- Seal all seams and joined areas of enclosure formed by shroud assembly and exhaust firewall with sealing compound, RTV106.
- Connect electrical connector to fire detector on rear panel.

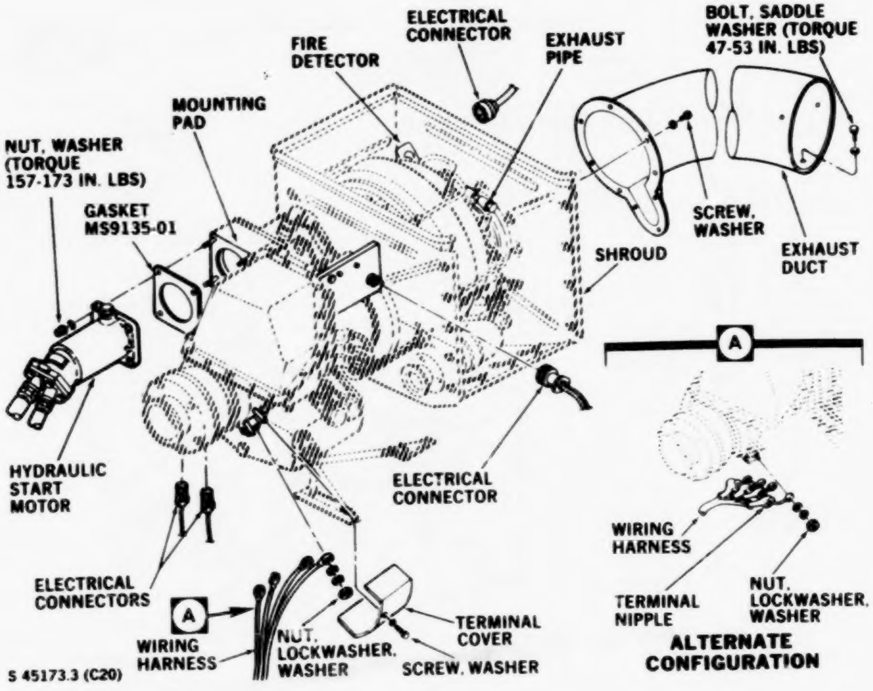

ELECTRICAL CONNECTOR
FIRE DETECTOR
EXHAUST PIPE
BOLT, SADDLE WASHER (TORQUE 47-53 IN. LBS)
MOUNTING PAD
NUT, WASHER (TORQUE 157-173 IN. LBS)
GASKET MS9135-01
SCREW, WASHER
EXHAUST DUCT
SHROUD
A
HYDRAULIC START MOTOR
ELECTRICAL CONNECTOR
WIRING HARNESS
ELECTRICAL CONNECTORS
A
WIRING HARNESS
NUT, LOCKWASHER, WASHER
TERMINAL COVER
SCREW, WASHER
TERMINAL NIPPLE
NUT, LOCKWASHER, WASHER
ALTERNATE CONFIGURATION
S 45173.3 (C20)

Figure 19-2 (Sheet 4 of 5)

STEP 2 INSTALL APU (CONT)

- Install gasket on hydraulic start motor mounting pad.
- Install hydraulic start motor on APU with washers and nuts. **TORQUE NUTS TO 157 - 173 INCH-POUNDS.**
- Deleted
- Unplug and connect hoses at APU fire extinguishing elbow, compartment drain, combustor drain, gear box vent, and fuel drain port on fuel control enclosure.

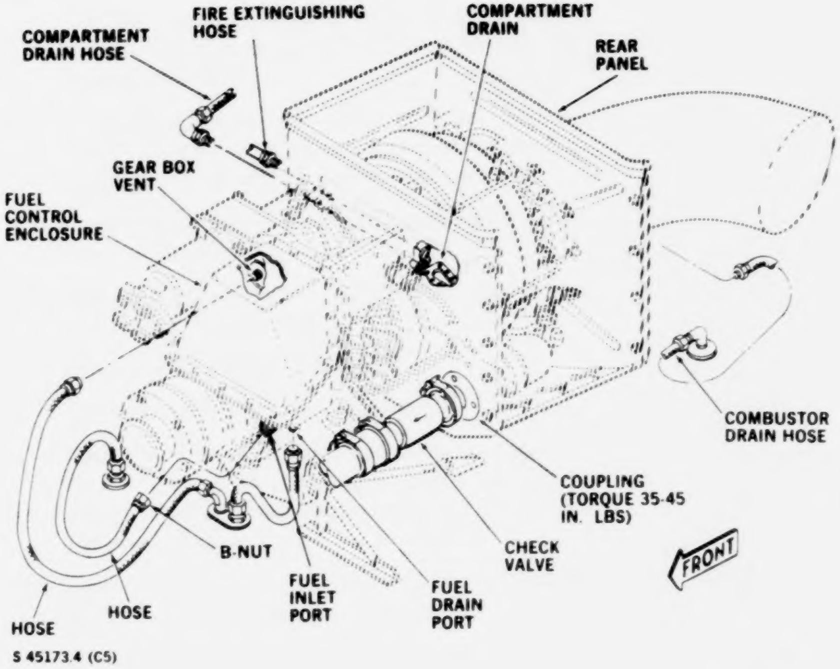

COMPARTMENT DRAIN HOSE
FIRE EXTINGUISHING HOSE
COMPARTMENT DRAIN
REAR PANEL
GEAR BOX VENT
FUEL CONTROL ENCLOSURE
COMBUSTOR DRAIN HOSE
COUPLING (TORQUE 35-45 IN. LBS)
CHECK VALVE
FRONT
B-NUT
FUEL INLET PORT
FUEL DRAIN PORT
HOSE
HOSE
S 45173.4 (C5)

Figure 19-2 (Sheet 5 of 5)

STEP 2 INSTALL APU (CONT)

CAUTION

To prevent damage to fuel filter, take care not to overtighten B-nut when installing fuel hose.

- Clamp APU check valve to pneumatic tube at front panel half firewall with coupling. **TORQUE COUPLING TO 35 - 45 INCH-POUNDS.**
- If fuel control cover was not previously removed, loosen stud fasteners, or remove screws, securing fuel control cover to fuel control base. Remove cover.

CAUTION

To avoid damage to fuel filter, union inside fuel control base must be held with a wrench when installing fuel inlet hose.

- Holding union inside base with a wrench, unplug and loosely connect fuel inlet hose to union under fuel control base.
- If bonding jumper was removed from fuel inlet hose, position clamp on hose and connect bonding jumper to clamp with screw, washers, and nut.
- Connect bonding jumper to airframe with screw, lockwasher, washers, and nut.
- Seal area around screw and airframe with sealing compound, MIL-S-8802.
- Prime APU fuel line (TASK 17).
- Clamp generator wiring to airframe.
- Check wire harness, fuel, and drain lines for contact. If contact occurs, reposition wire harness and/or fuel and drain lines. Fasten, using extra clamps as required.
- Check area to be sure it is free of foreign objects, then install APU compartment doors.
- Do an operational check of APU (TM 55-1520-237-23-3).

STEP 3 SERVICE APU

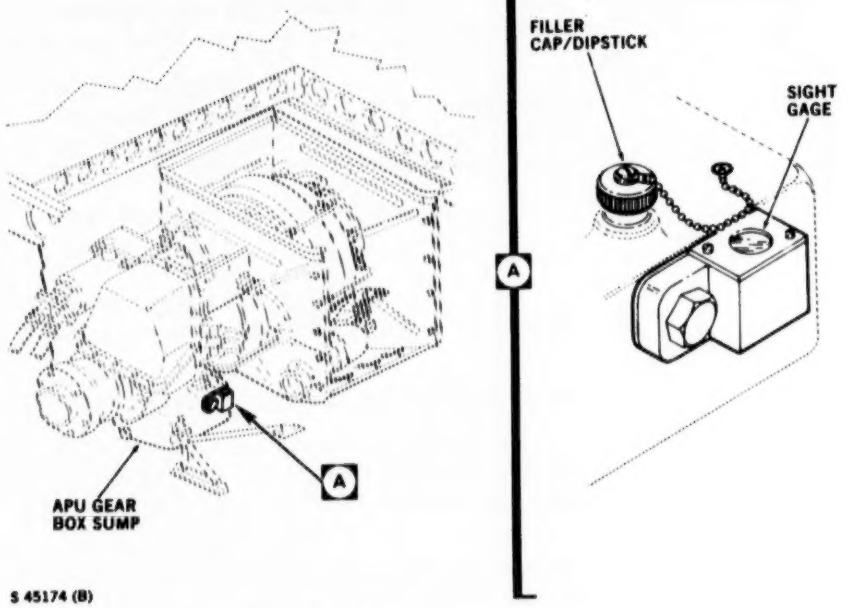
SERVICE

- Unlatch and hinge open APU compartment door.

NOTE

> To determine correct oil level, the aircraft should be on normal 3-point landing gear position on level ground and not have been operated for at least 1 hour.

- Check oil level on sight gage. Word ADD will show if oil is low.
- Press down on filler cap, turn 1/4-turn counterclockwise, and remove from APU gear box sump.


APU GEAR BOX SUMP
A
A
FILLER CAP/DIPSTICK
SIGHT GAGE

S 45174 (B)

Figure 19-3

STEP 3 SERVICE APU

SERVICE

- Unlatch and hinge open APU compartment door.

NOTE

To determine correct oil level, the aircraft should be on normal 3-point landing gear position on level ground and not have been operated for at least 1 hour.

- Deleted.

WARNING

Injury to personnel could result from servicing APU when hot. Allow at least one hour cooldown time prior to servicing.

- Press down on filler cap, turn 1/4-turn counterclockwise, remove from APU gear box sump, and check oil level on dipstick.

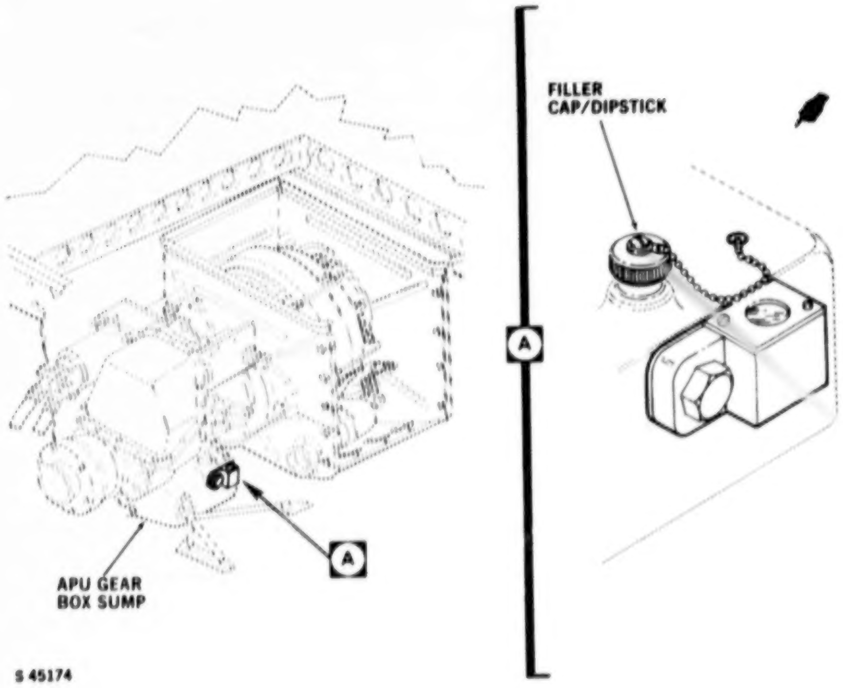


Figure 19-3

STEP 3 SERVICE APU (CONT)

WARNING

Deleted.

CAUTION

- Lubricating oils (MIL-L-23699 and MIL-L-7808) are usually chemically compatible and are not harmful when mixed in any proportions; however, the high detergency of MIL-L-23699 oil has caused problems in some applications when mixed with MIL-L-7808 oil. Therefore, these oils should not be mixed except under extreme emergency conditions. Then oil mixture should be drained and the tank or sump refilled with the regularly used oil.
- Never overfill oil sump. An overfull sump will result in oil foaming, low oil pressure, and abnormal gear wear.

NOTE

When operating in arctic conditions (-25°F or below) lubricating oil MIL-L-7808 must be used in APU oil system.

- Fill sump with lubricating oil, MIL-L-23699 or MIL-L-7808, to proper oil level shown on filler cap/dipstick. Do not mix oils.
- Install filler cap. Press down on cap and turn 1/4-turn clockwise.
- Check area for cleanness and foreign material.
- Close and latch APU compartment door.

STEP 4 PRESERVE/DEPRESERVE APU

PRESERVE

- Preserve APU using procedures for short-term storage (TM 55-1520-237-23-4).

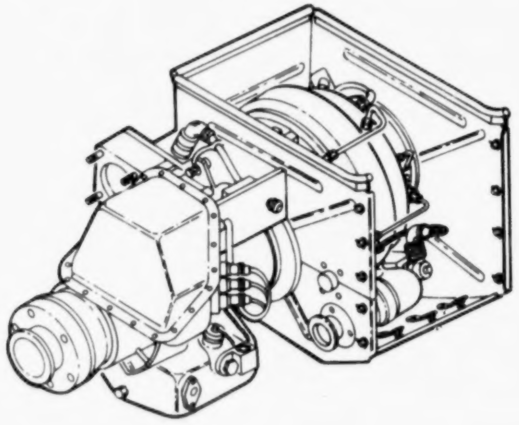
DEPRESERVE

- Depreserve APU using procedures for short-term storage (TM 55-1520-237-23-4).

TASK 20

AUXILIARY POWER UNIT (APU) - REPLACE COMPONENTS

- REPLACE EXHAUST DUCT - STEP 1
- REPLACE EXHAUST PIPE - STEP 1.1
- REPLACE SHROUD ASSEMBLY - STEP 2
- REPLACE MOUNTING LUGS - STEP 3
- REPLACE FUEL FILTER - STEP 4
- REPLACE OIL FILTER - STEP 5
- REPLACE OIL PRESSURE SWITCH - STEP 6
- REPLACE SPARK PLUG - STEP 7
- REPLACE START BYPASS VALVE - STEP 8
- REPLACE FUEL DRAIN CHECK VALVE - STEP 9
- REPLACE START MOTOR - STEP 10
- REPLACE FUEL PUMP/ACCELERATION CONTROL - STEP 11
- REPLACE FUEL SOLENOID VALVES - STEP 12
- REPLACE PURGE VALVE - STEP 13
- REPLACE START NOZZLE - STEP 14
- REPLACE IGNITION CABLE - STEP 15



S 45175 (B)

- **REPLACE IGNITION CABLE - STEP 15**
- **REPLACE FUEL MANIFOLD - STEP 16**
- **REPLACE IGNITION EXCITER - STEP 17**
- **REPLACE SPEED SENSOR - STEP 18**
- **REPLACE OIL LEVEL SIGHT GAGE - STEP 19**
- **REPLACE ELECTRICAL HARNESS/THERMOCOUPLE - STEP 20**
- **REPLACE COMBUSTOR HOUSING - STEP 21**
- **REPLACE COMBUSTOR LINER/SEALS - STEP 22**
- **REPLACE OIL TEMPERATURE SWITCH - STEP 23**
- **REPLACE AIR INLET SCREEN - STEP 24**
- **REPLACE TUBE BUNDLE - STEP 25**
- **REPLACE SPLINE ADAPTER - STEP 26**

PERSONNEL REQUIRED

- Two People Required: MOS 67T - Tactical Transport Helicopter Repairer
  MOS 68B - Aircraft Powerplant Repairer
  (STEPS 2 through 26)

SUPPLIES

- Adhesive, RTV730, NSN 8046-00-251-2312 (STEPS 1, 9, 15)
- Antiseize Compound, MIL-A-907 (STEPS 1, 1.1, 7, 14, 16, 22, 26)
- Degreasing Solvent O-T-620, NSN 6810-00-930-6311 (STEP 4)
- Dry-Cleaning Solvent, Fed. Spec P-D-680, Type II (STEP 9)
- Gasket, AN763-12 (1 Required, STEP 8)
- Gasket, MS9135-01 (1 Required, STEP 10)
- Gasket, 160365-1 (FSCM 55820) (1 Required, STEP 4)
- Grease, MIL-G-21164 (STEP 10)
- Grease, MIL-G-81827 (STEP 26)
- Hydraulic Fluid, MIL-H-83282 (STEP 10)
- Hydraulic Fluid, MIL-H-5606 (STEP 10)
- Lockwire, MS20995C20 (STEPS 2, 3, 6, 7, 8, 15, 17, 18, 20, 23)
- Lockwire, MS20995C32 (STEPS 2, 6, 8, 10, 12, 15, 21, 23, 24)
- Loctite Compound, #69 (FSCM 05972) (STEP 18)
- Lubricating Oil, MIL-L-23699 (STEPS 6, 16, 22, 23, 25)
- Non-metallic Scraper (STEPS 9, 15)
- Oil Filter Element, 27570-0 (FSCM 55820) (STEP 5)
- Packing, MS28778-4 (1 Required, STEP 10)
- Packing, MS9387-03 (1 Required, STEP 11)
- Packing, MS9387-04 (1 Required, STEP 6)
(3 Required, STEP 11)
(7 Required, STEP 12)
- Packing, MS9387-05 (1 Required, STEP 20)

SUPPLIES (CONT)

- Packing, MS9387-06 (2 Required, STEP 4)
  (1 Required, STEP 9)
  (1 Required, STEP 11)
- Packing, MS9388-006 (6 Required, STEP 22)
- Packing, MS9388-007 (2 Required, STEP 11)
- Packing, MS9388-011 (2 Required, STEP 11)
- Packing, MS9388-012 (1 Required, STEP 25)
- Packing, MS9388-016 (1 Required, STEP 16)
- Packing, MS9388-019 (1 Required, STEP 4)
- Packing, MS9388-026 (1 Required, STEP 5)
- Packing, MS9388-027 (1 Required, STEP 4)
- Packing, MS9388-029 (1 Required, STEP 11)
- Packing, MS9388-118 (1 Required, STEP 19)
- Packing, NAS 1595-6 (1 Required, STEP 9)
- Petrolatum, Fed. Spec VV-P-236, NSN 9150-00-250-0926 (STEP 10)
- Retainer, MS28773-4 (1 Required, STEP 10)
- Sealant, RTV106, NSN 8040-00-902-3871 (STEPS 1, 9, 15)
- Trichloroethane, O-T-620, NSN 6810-00-930-6311 (STEP 4)

TOOLS

- Adapter, ST-93014 (FSCM 55820) (STEP 21)
- Aircraft Mechanic's Toolkit, NSN 5180-00-323-4692
- Blunt-Ended Punch, NSN 5120-00-242-4966 (STEP 22)

TOOLS (CONT)

- Combustor Puller Tool, ST-91125 (FSCM 55820) (STEP 21)
- Engine and Powertrain Repairman's Toolkit, NSN 5180-00-323-4944
- Machinist's Scribe, NSN 5120-00-221-7063 (STEP 26)
- Puller, NSN 5180-00-009-5048 (STEP 26)
- Pusher/puller, NSN 5120-00-288-7714 (STEP 26)
- Spark Plug, MS20995C20 (STEP 15)
- Tapered End Steel Rod, 1/8-Inch (STEP 22)
- Torque Wrench, 0 - 30 in. lbs, NSN 5120-00-117-4832 (STEP 1)
- Torque Wrench, 30 - 150 in. lbs, NSN 5120-00-542-4489 (STEPS 7, 8, 14, 16, 19, 21, 22)
- Torque Wrench, 150 - 750 in. lbs, NSN 5120-00-821-3441 (STEP 10)

ALSO NEEDED

- Protective Plugs and Caps (STEPS 2, 4, 10, 21)
- Tags (STEPS 10, 11, 12)
- TASK 17 (STEPS 4, 11)
- TASK 19 (STEPS 1, 2, 3, 8, 9, 16, 20, 21, 22, 23, 26)
- TM 55-1500-204-25/1 (STEP 4)
- TM 55-1520-237-23-3 (STEPS 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 23, 25)
- TM 55-1520-237-23-4 (STEP 11)
- TM 55-1520-237-23-5 (STEPS 6, 9)
- TM 55-1520-237-23-8 (STEP 10)
- Wood supporting block (wedge) (STEP 3)

STEP 1 REPLACE EXHAUST DUCT

REMOVE EXHAUST DUCT

- Turn off all electrical power.
- Unlatch and hinge open APU compartment doors.
- Remove exhaust duct/rear shroud fasteners.
- Unbolt exhaust duct from airframe fairing.
- Pull duct through fairing until flange reaches fairing. Rotate duct until flange finger points forward. Remove duct.
- Deleted.
- Deleted.
- Cover APU exhaust pipe.

DELETED

- Deleted.

DELETED

- Deleted.
- Deleted.
- Deleted.
- Deleted.
- Deleted.

NOTE

Exhaust pipe can be replaced with APU (TASK 19).

STEP 1 REPLACE EXHAUST DUCT (CONT)

INSTALL EXHAUST DUCT

- Turn off all electrical power.
- Remove protective cover from APU exhaust pipe.
- With finger on mounting flange pointing forward, install exhaust duct through airframe fairing.
- Apply a bead on sealant, RTV106 to mounting flange, and install exhaust duct to rear shroud with screws and washers.
- Secure exhaust duct to airframe fairing with bolts and saddle washers. **TORQUE BOLTS TO 47 - 53 INCH-POUNDS.**
- Make sure compartment areas are free of foreign objects.
- Close and latch APU compartment doors.

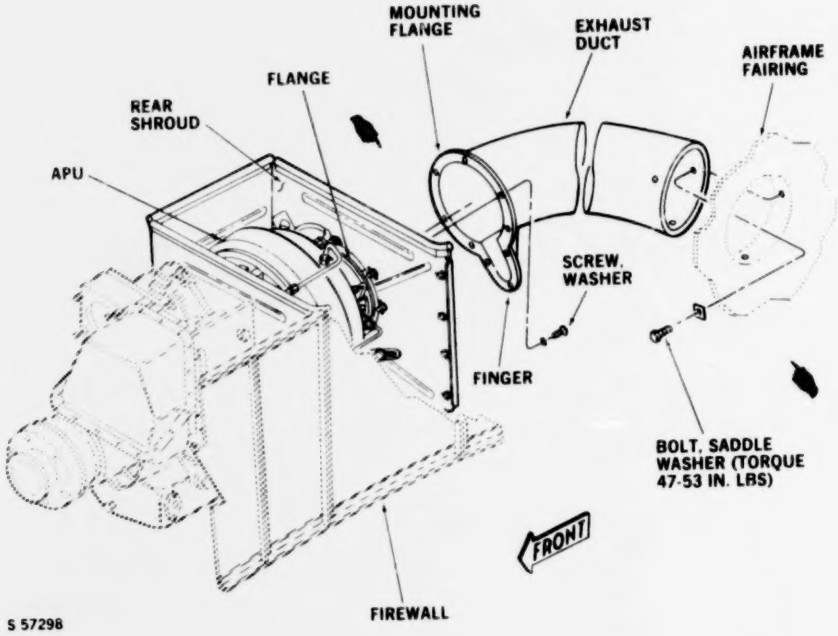

MOUNTING FLANGE
EXHAUST DUCT
AIRFRAME FAIRING
FLANGE
REAR SHROUD
APU
SCREW, WASHER
FINGER
BOLT, SADDLE WASHER (TORQUE 47-53 IN. LBS)
FRONT
FIREWALL
S 57298

Figure 20-1

STEP 1.1 REPLACE EXHAUST PIPE

REMOVE

- Turn off all electrical power.
- Loosen exhaust pipe clamp bolt.
- Slide exhaust pipe out through exhaust duct.

INSTALL

- Turn off all electrical power.
- Coat internal beaded surface of exhaust pipe with antiseize compound, MIL-A-907.
- Pass exhaust pipe up through exhaust duct. Position pipe on APU flange. **TORQUE CLAMP BOLT TO 20 - 25 INCH-POUNDS.**
- Tap around clamp with a plastic mallet. **CHECK CLAMP BOLT TORQUE FOR 20 - 25 INCH-POUNDS.** Continue tapping and checking clamp bolt torque until two successive trials show no loss of torque.
- Check area for cleanness and foreign materials.

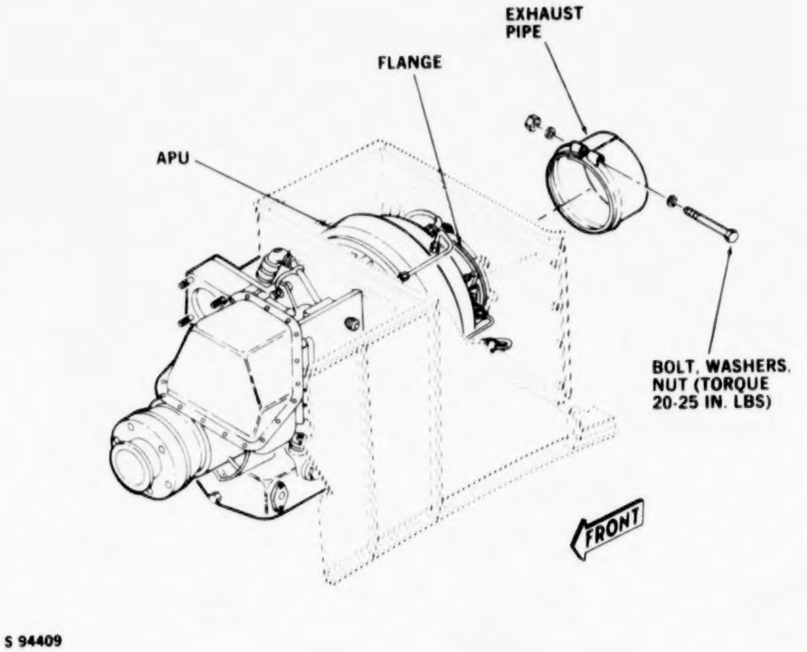


Figure 20-1.1

STEP 2 REPLACE SHROUD ASSEMBLY

REMOVE

- Turn off all electrical power.
- Remove APU from helicopter (TASK 19).
- Remove bolts, washers, and firewall sleeves.
- Loosen and remove band clamp holding upper and lower front firewall panel halves together.
- Remove screws holding cover halves around bleed-air outlet flange. Remove cover halves from lower front panel half.
- Remove screws holding front panel halves to shroud assembly. Remove front panel halves.
- Remove lockwire from combuster drain in rear panel.
- Loosen and remove aft mounting lug from compressor.
- Remove shroud assembly surrounding APU hot section, carefully sliding off combustor drain.

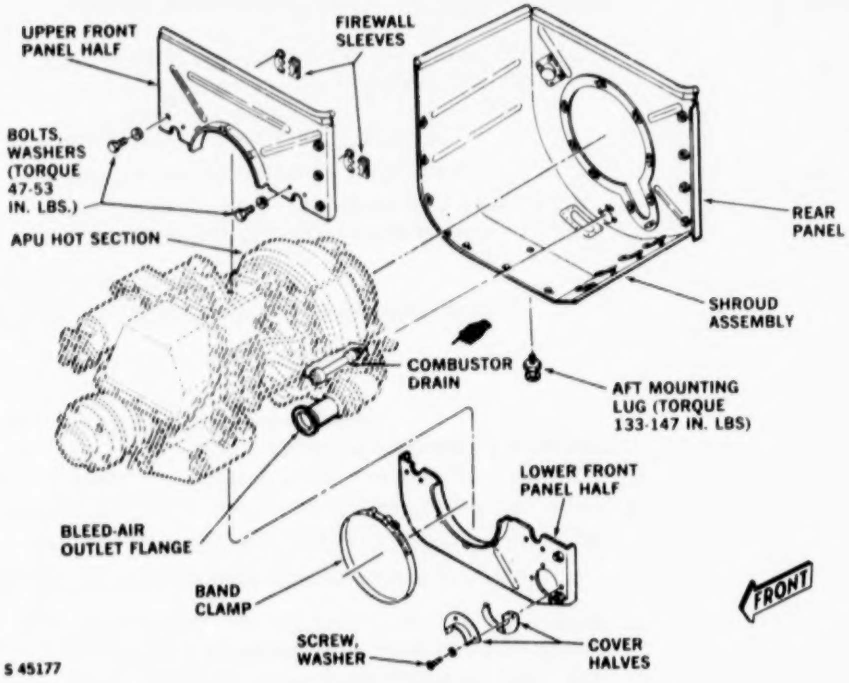

UPPER FRONT PANEL HALF
FIREWALL SLEEVES
BOLTS, WASHERS (TORQUE 47-53 IN. LBS.)
APU HOT SECTION
REAR PANEL
SHROUD ASSEMBLY
COMBUSTOR DRAIN
AFT MOUNTING LUG (TORQUE 133-147 IN. LBS)
LOWER FRONT PANEL HALF
BLEED-AIR OUTLET FLANGE
BAND CLAMP
FRONT
SCREW, WASHER
COVER HALVES
S 45177

Figure 20-2

STEP 2 REPLACE SHROUD ASSEMBLY (CONT)

INSTALL

- Install shroud assembly around APU hot section.
- Install aft mounting lug in APU compressor. **TORQUE LUG TO 133 - 147 INCH-POUNDS.** Lockwire, MS20995NC20, lug to shroud assembly.
- Lockwire, MS20995NC20, combustor drain to cover on rear panel.
- Seal shroud assembly with sealant, RTV106 (TASK 19).

CAUTION

Make sure ignition lead, thermocouple lead, and wiring for valves and switches is positioned to prevent chafing and pinching when panel halves are installed.

- Place upper and lower front panels on APU and fasten front panel halves to shroud with washers and screws.
- Install band clamp around front panel halves.
- Position leads and electrical wiring inside firewall sleeves and install firewall sleeves to front panel halves with bolts and washers. **TORQUE BOLTS TO 47 - 53 INCH-POUNDS.** Lockwire, MS20995NC32, bolts together.

NOTE

Lockwire bolts only on right side sleeves (looking forward).

- Place cover halves around bleed-air outlet flange, and fasten to lower front panel with washers and screws.
- Install APU in helicopter (TASK 19).

STEP 3 REPLACE MOUNTING LUGS

REMOVE FORWARD RH MOUNTING LUG

- Turn off all electrical power.
- Unlatch and hinge open APU compartment door.
- Use wood wedge to block up APU under gear box sump to relieve APU weight from forward supports, or install sling on APU and attach to maintenance crane or hoist. Take up slack to support weight of APU.
- Remove washer and bolt securing forward RH mounting lug to forward inboard support.
- Remove washers and bolts securing RH mounting lug to APU gear box sump, and remove mounting lug.

INSTALL FORWARD RH MOUNTING LUG

- Turn off all electrical power.
- Install forward RH mounting lug ("TOP" side up) to APU gear box sump with washers and bolts. **TORQUE BOLTS TO 104 - 116 INCH-POUNDS.**
- Remove wood wedge under APU gear box sump.
- Secure RH mounting lug to forward inboard support with washer and bolt. **TORQUE BOLT TO 104 - 116 INCH-POUNDS.**
- Make sure area is free of foreign objects.
- Close and latch APU compartment door.

REMOVE FORWARD LH MOUNTING LUG

- Turn off all electrical power.
- Unlatch and hinge open APU compartment door.
- Use wood wedge to block up APU under gear box sump to relieve APU weight from forward supports.
- Remove washer and bolt securing forward LH mounting lug to forward outboard support.
- Remove washers and bolts securing LH mounting lug to APU gear box sump, and remove mounting lug.

STEP 3 REPLACE MOUNTING LUGS (CONT)

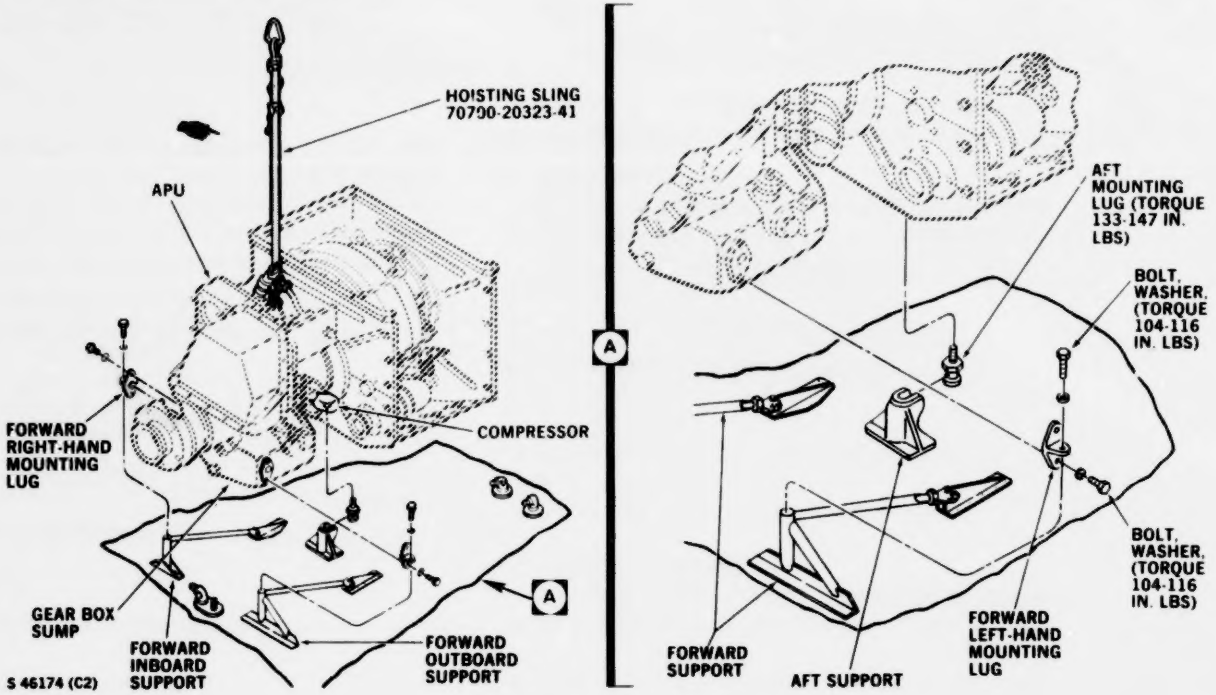

HOISTING SLING
70790-20323-41
APU
FORWARD
RIGHT-HAND
MOUNTING
LUG
COMPRESSOR
GEAR BOX
SUMP
FORWARD
INBOARD
SUPPORT
FORWARD
OUTBOARD
SUPPORT
A
S 46174 (C2)
A
AFT
MOUNTING
LUG (TORQUE
133-147 IN.
LBS)
BOLT,
WASHER,
(TORQUE
104-116
IN. LBS)
BOLT,
WASHER,
(TORQUE
104-116
IN. LBS)
FORWARD
LEFT-HAND
MOUNTING
LUG
FORWARD
SUPPORT
AFT SUPPORT

Figure 20-3

STEP 3 REPLACE MOUNTING LUGS (CONT)

INSTALL FORWARD LH MOUNTING LUG

- Turn off all electrical power.
- Install forward LH mounting lug ("TOP" side up) to APU gear box sump with washers and bolts. **TORQUE BOLTS TO 104 - 116 INCH-POUNDS.**
- Remove wood wedge under APU gear box sump.
- Secure LH mounting lug to forward outboard support with washer and bolt. **TORQUE BOLT TO 104 - 116 INCH-POUNDS.**
- Make sure area is free of foreign objects.
- Close and latch APU compartment door.

REMOVE AFT MOUNTING LUG

- Turn off all electrical power.
- Remove APU (TASK 19).
- Loosen and remove AFT mounting from APU compressor.

INSTALL AFT MOUNTING LUG

- Turn off all electrical power.
- Install aft mounting lug, in APU compressor. **TORQUE LUG TO 133 - 147 INCH-POUNDS.** Lockwire, MS20995NC20, lug to shroud assembly.
- Install APU (TASK 19).
- Make sure area is free of foreign objects.
- Close and latch APU compartment door.

STEP 4 REPLACE FUEL FILTER

REMOVE

- Turn off all electrical power
- Unlatch and hinge open APU compartment door.
- Loosen stud fasteners, or remove screws securing fuel control cover to fuel control base. Remove cover.
- Remove screws and fuel pump cover from top of fuel pump.
- Remove fuel pump filter and packings. Discard packings.

CAUTION

Always use a wrench on filter hexnut next to fitting being removed. Restraining filter at the opposite end may overstress filter and cause leakage.

- Disconnect fuel inlet tube from fuel pump and fuel filter.

CAUTION

To avoid damage to fuel filter, union inside fuel control base must be held with a wrench when loosening or tightening fuel line.

- Holding union inside base with a wrench, disconnect fuel hose from union under fuel control base. Plug hose.
- Remove nut and washers from union. Remove union, elbow, and fuel filter from fuel control base as an assembly.

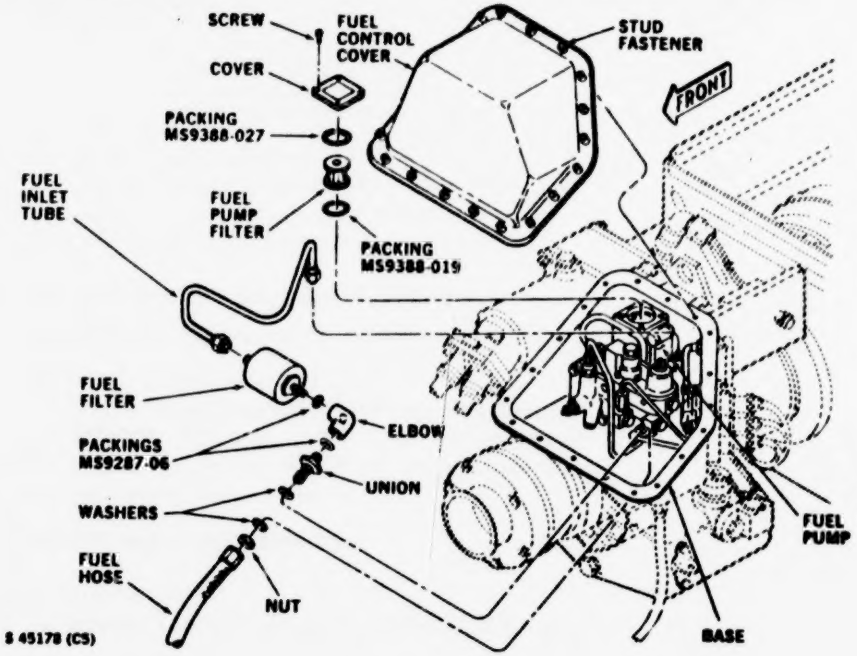

SCREW
FUEL CONTROL COVER
STUD FASTENER
COVER
FRONT
PACKING MS9388-027
FUEL INLET TUBE
FUEL PUMP FILTER
PACKING MS9388-019
FUEL FILTER
ELBOW
PACKINGS MS9287-06
UNION
WASHERS
FUEL PUMP
FUEL HOSE
NUT
BASE
S 45178 (CS)

Figure 20-4

STEP 4 REPLACE FUEL FILTER (CONT)

- Unthread elbow from fuel filter. Remove packings from elbow.

INSTALL

- Turn off all electrical power.
- Place fuel pump filter in fuel pump with packing, MS9388-019.
- Install cover on fuel pump with screws and packing, MS9388-027.

CAUTION

Always use a wrench on filter hexnut next to fitting being installed. Restraining filter at the opposite end may overstress filter and cause leakage.

STEP 4 REPLACE FUEL FILTER (CONT)

- Install packings, MS9387-06, on elbow. Thread elbow onto fuel filter inlet.
- Place fuel filter, elbow, and union, in fuel control base as an assembly. Install washer and nut to secure assembly to base.
- Connect fuel inlet tube between fuel filter and fuel pump.

CAUTION

To avoid damage to fuel filter, union inside fuel control base must be held with a wrench when loosening or tightening fuel line.

- Holding union inside base with a wrench, unplug and loosely connect fuel inlet hose to union under fuel control base.
- Prime APU fuel line (TASK 17). Check for fuel leakage. Tighten connections if necessary.
- Make sure area in fuel control base is free of foreign objects.
- Check cover for damage gaskets or fasteners. If gasket or fasteners are loose or damaged, do this:
  - Replace fasteners per TM 55-1500-204-25/1.
  - Remove old gasket using a wooden or plastic scraper. Clean area with a clean cloth dampened with trichloroethane, O-T-620.
  - Wipe area dry with a clean cloth.
  - Apply a light coat of adhesive, RTV730, to bottom of cover. Position gasket on cover and apply pressure. Wipe off extra adhesive with a clean cloth.
- Install fuel control cover on fuel control base. Lock and secure cover with stud fasteners.
- Make sure area around APU is free of foreign objects.
- Close and latch APU compartment door.

STEP 5 REPLACE OIL FILTER

REMOVE

- Unlatch and hinge open APU compartment doors.
- Remove retaining ring holding cap in oil filter housing. Pull filter out as far as it will go. Separate cap from filter. Pull filter out completely. Remove packing from cap.

INSTALL

- Install packing, MS9388-026, in groove on cap. Install filter, and cap in oil filter housing. Install retaining ring.
- Make sure area is free of foreign objects.
- Close and latch APU compartment door.
- Do an operational check (TM 55-1520-237-23-3).

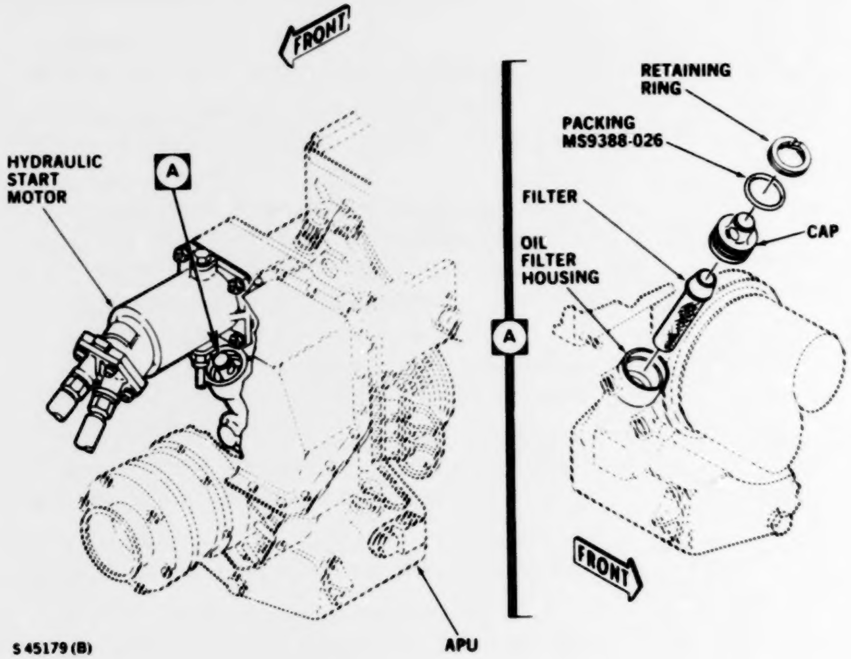

FRONT
HYDRAULIC START MOTOR
A
RETAINING RING
PACKING MS9388-026
FILTER
CAP
OIL FILTER HOUSING
A
FRONT
APU
S 45179 (B)

Figure 20-5

STEP 6 REPLACE OIL PRESSURE SWITCH

REMOVE

- Turn off all electrical power.
- Remove both APU compartment doors (right and left sides) (TM 55-1520-237-23-5).
- Disconnect electrical plug from oil pressure switch.
- Remove oil pressure switch from APU reduction drive assembly. Remove packing from oil pressure switch.

INSTALL

- Turn off all electrical power.
- Lubricate packing, MS9387-04, with lubricating oil, MIL-L-23699. Install packing on oil pressure switch.
- Install oil pressure switch into APU reduction drive assembly, and tighten. Lockwire, MS20995C32, oil pressure switch to APU.

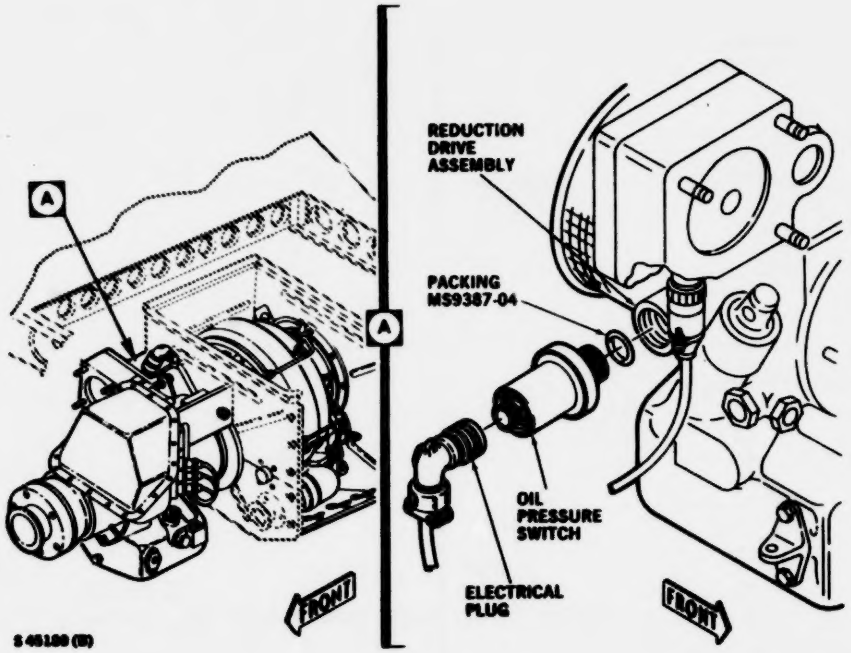

A
A
REDUCTION DRIVE ASSEMBLY
PACKING MS9387-04
OIL PRESSURE SWITCH
ELECTRICAL PLUG
FRONT
FRONT

Figure 20-6

STEP 6 REPLACE OIL PRESSURE SWITCH (CONT)

- Connect electrical plug to oil pressure switch. Lockwire, MS20995C20, plug to switch.
- Do an operational check and check for leaks (TM 55-1520-237-23-3).
- Check area to be sure it is free of foreign objects.
- Install APU compartment doors (TM 55-1520-237-23-5).

STEP 7 REPLACE SPARK PLUG

REMOVE

- Turn off all electrical power.
- Unlatch and hinge open APU compartment door.
- Disconnect APU electrical harness from upper end of ignition exciter.
- Disconnect ignition cable from spark plug.
- Remove spark plug from bleed-air combustor housing.
- Inspect for carbon contamination or eroded tips. Replace if necessary.

INSTALL

- Turn off all electrical power.
- Apply anti-seize compound, MIL-A-907, to threads of replacement spark plug end that goes into bleed-air combustor housing.
- Thread spark plug into bleed air combustor housing. **TORQUE PLUG TO 108 - 132 INCH-POUNDS.**
- Connect ignition cable to spark plug. Lockwire, MS20995C20, cable to plug.
- Connect APU electrical harness to ignition exciter. Lockwire harness to exciter, MS20995C20.

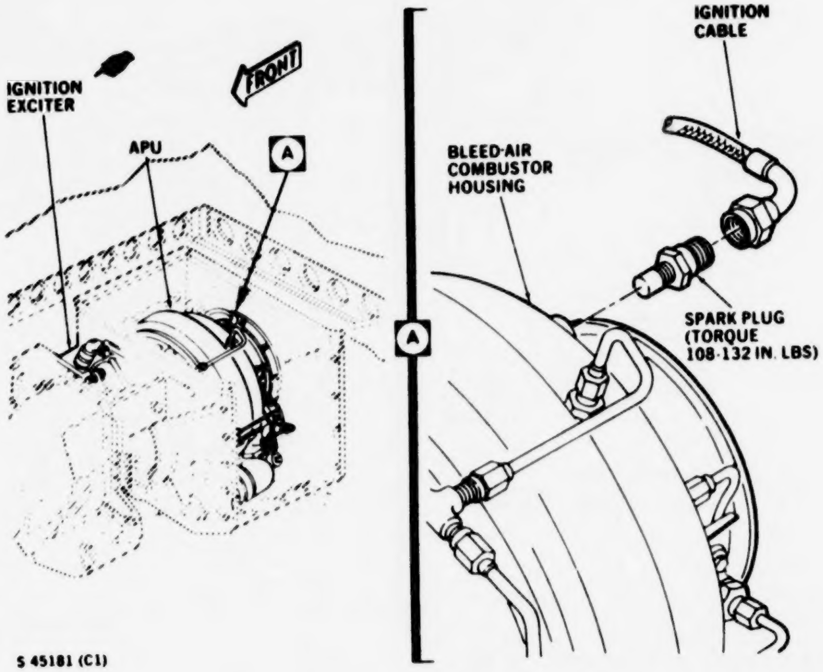

IGNITION EXCITER
FRONT
APU
A
S 45181 (C1)
IGNITION CABLE
BLEED-AIR COMBUSTOR HOUSING
A
SPARK PLUG (TORQUE 108-132 IN. LBS)

Figure 20-7

STEP 7 REPLACE SPARK PLUG (CONT)

- Check area to be sure it is free of foreign objects.
- Close and latch APU compartment door.
- Do an operational check (TM 55-1520-237-23-3).

STEP 8 REPLACE START BYPASS VALVE

REMOVE

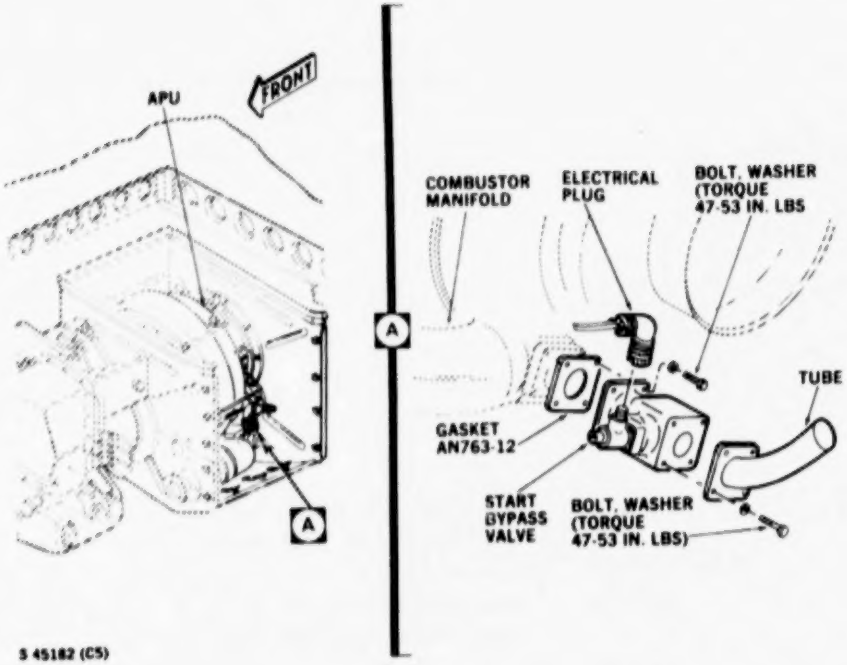
- Turn off all electrical power.
- Remove APU from helicopter (TASK 19).
- Disconnect electrical plug from start bypass valve.
- Unbolt tube from start bypass valve.
- Unbolt and remove start bypass valve and gasket from combustor housing manifold.

INSTALL

- Turn off all electrical power.
- Install start bypass valve onto combustor housing manifold with bolts, washers, and gasket, AN763-12. **TORQUE BOLTS TO 47 - 53 INCH-POUNDS.** Lockwire, MS20995C32, bolts.

NOTE

Single strand of lockwire, MS20995C32 is acceptable.


APU
FRONT
A
A
COMBUSTOR MANIFOLD
ELECTRICAL PLUG
BOLT, WASHER (TORQUE 47-53 IN. LBS
TUBE
GASKET AN763-12
START BYPASS VALVE
BOLT, WASHER (TORQUE 47-53 IN. LBS)

S 45182 (C5)

Figure 20-8

STEP 8 REPLACE START BYPASS VALVE (CONT)

- Install tube on start bypass valve with bolts and washers. **TORQUE BOLTS TO 47 - 53 INCH-POUNDS**. Lockwire, MS20995C32, bolts.

NOTE

When installing tube with slotted boltholes, adjust for clearance between rear panel and tube.

- Connect electrical plug to start bypass valve. Lockwire, MS20995C32, plug to valve.

STEP 8 REPLACE START BYPASS VALVE (CONT)

- Install APU in helicopter (TASK 19).
- Do an operational check and check for leaks (TM 55-1520-237-23-3).
- Make sure compartment areas are free of foreign objects.
- Close and latch APU compartment door.

STEP 9 REPLACE FUEL DRAIN CHECK VALVE

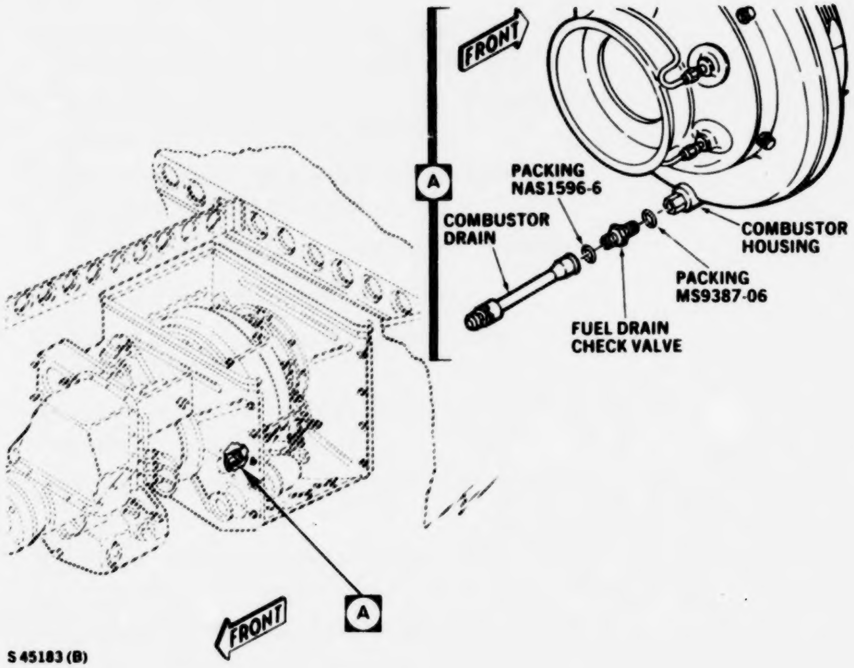
REMOVE

- Turn off all electrical power.
- Remove combustor drain by unscrewing and drawing through shroud.

CAUTION

> Be sure socket is only on fuel drain check valve, and has not slid over combustor housing.

- Remove fuel drain check valve with socket and extension from combustor housing. Remove packings from valve.
- Tap valve against hand. Valve should rattle. Replace as necessary.
- Remove RTV compound from around combustor drain with plastic scraper.


FRONT
A
PACKING NAS1596-6
COMBUSTOR DRAIN
COMBUSTOR HOUSING
PACKING MS9387-06
FUEL DRAIN CHECK VALVE
FRONT
A

S 45183 (B)

Figure 20-9

STEP 9 REPLACE FUEL DRAIN CHECK VALVE (CONT)

INSTALL

WARNING

To prevent damage to equipment or injury to personnel, make certain fuel drain check valve is installed with large hole toward combustor housing or with arrow pointing away from housing.

- Alternately pour cleaning solvent, Fed. Spec P-D-680, Type II, or equivalent, into each end of fuel drain check valve to determine free-flow direction. When installed correctly, flow shall be out of combustor housing toward combustor drain.
- Check drain outlet at airframe for free flow.
- Install packing, MS9387-06, on end of fuel drain check valve that threads into combustor housing.
- Install packing, NAS 1595-6, on end of fuel drain check valve that combustor drain fits on.
- Install fuel drain check valve in combustor housing with socket and extension.
- Install combustor drain on fuel drain check valve.
- Connect drain line to combustor drain.
- Seal shroud area around combustor drain with sealant, RTV106.
- Make sure compartment areas are free of foreign objects.
- Install APU compartment door (TM 55-1520-237-23-5).
- Do an operational check and check for free-flow of fuel at drain outlet (TM 55-1520-237-23-3).

STEP 10 REPLACE START MOTOR

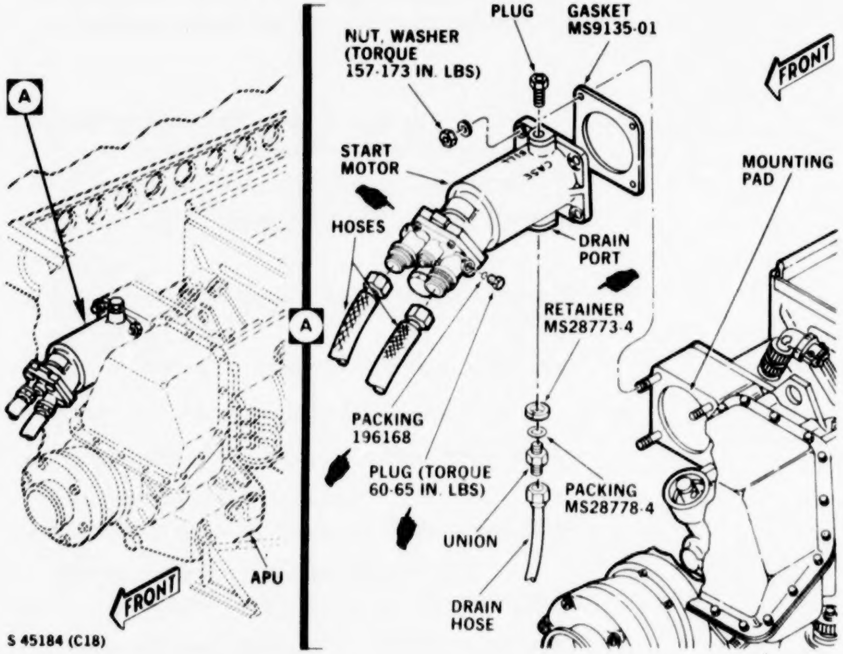
REMOVE

- Turn off all electrical power

WARNING

Place tag on APU start valve in cabin midsection overhead warning personnel not to manually operate start valve as start motor is being replaced.

- Unlatch and hinge open APU compartment door.
- Remove hoses from PRESS and RETURN ports on start motor. Cap ports on motor and plug hoses.


A
APU
FRONT
A
PLUG
GASKET MS9135-01
NUT, WASHER (TORQUE 157-173 IN. LBS)
FRONT
START MOTOR
CASE
MOUNTING PAD
HOSES
DRAIN PORT
RETAINER MS28773-4
PACKING 196168
PLUG (TORQUE 60-65 IN. LBS)
PACKING MS28778-4
UNION
DRAIN HOSE

S 45184 (C18)

Figure 20-10

STEP 10 REPLACE START MOTOR (CONT)

- Disconnect drain hose from union on start motor. Cap port and plug drain hose.
- Remove nuts, start motor, and gasket from APU.
- Remove union, packing, and retainer from start motor.

NOTE

If experiencing interference between plug and solar unit cover, replace with low profile plug.

- **TORQUE PLUG TO 60-65 INCH-POUNDS.** Lockwire, MS20995C32, plug to start motor body.

INSPECT

- Drive shaft shall not measure less than 0.735 inches when two 0.096-inch pins are placed on splines.
- See TM 55-1520-237-23-4 for shaft seal leakage limits.

STEP 10 REPLACE START MOTOR (CONT)

INSTALL

- Turn off all electrical power.
- Lubricate packing, MS28778-4, retainer, MS28773-4, and union threads with petrolatum, Fed. Spec VV-P-236.
- Install packing on union and thread union into start motor drain port.
- Remove plug from CASE FILL port on start motor. Fill motor completely with hydraulic fluid, MIL-H-83282. Install plug in CASE FILL port.

NOTE

For arctic operation, -29°F (-34°C), use MIL-H-5606 hydraulic fluid.

- Install gasket, MS9135-01, on start motor mounting pad.
- Lubricate motor coupling shaft with grease, MIL-G-21164.
- Install start motor on APU with washers and nuts. **TORQUE NUTS TO 157 - 173 INCH POUNDS.**
- Unplug and connect drain hose to union on start motor.
- Remove caps from PRESS and RETURN ports on start motor. Unplug and connect hoses to PRESS and RETURN ports.
- Remove tag from APU start valve.
- Manually operate APU start valve in cabin midsection overhead to motor APU (TM 55-1520-237-23-8).
- Check start motor for leaks. If leakage is found, make sure hose connections are properly tightened.
- Do an operational check (TM 55-1520-237-23-3).
- Make sure compartment areas are free of foreign objects.
- Close and latch APU compartment door.

STEP 11 REPLACE FUEL PUMP/ACCELERATION CONTROL

REMOVE

- Turn off all electrical power.
- Unlatch and hinge open APU compartment door.
- Unlock stud fasteners securing cover to fuel control base. Remove cover and gasket.

CAUTION

Always use a wrench on filter hexnut next to fitting being removed. Restraining filter at the opposite end may overstress filter and cause leakage.

- Disconnect tube from fuel filter and elbow on fuel pump. Tag tube for installation.
- Disconnect tubes from solenoid valves and union and fittings on acceleration control. Tag tubes for installation.
- Disconnect tube from elbow on fuel control base and union on acceleration control. Tag tube for installation.
- Unbolt and remove fuel pump/acceleration control from fuel control base and reduction drive assembly.

TEARDOWN/BUILDUP

- Loosen nut and remove elbow from fuel pump.
- Remove packing from elbow.
- Remove bolts and washers securing pump to acceleration control. Separate pump from control and remove packings.
- Install packing, MS9387-06, on elbow. Install elbow on replacement fuel pump.
- Remove unions from acceleration control. Remove packings from unions.
- Install packings, MS9387-03 and -04, on unions. Install unions on replacement acceleration control.
- Remove bolts and fittings from acceleration control. Remove packings from fittings.
- Install packings, MS9387-04 and MS9388-011, on fittings. Install fittings on replacement acceleration control with bolts.

STEP 11 REPLACE FUEL PUMP/ACCELERATION CONTROL (CONT)

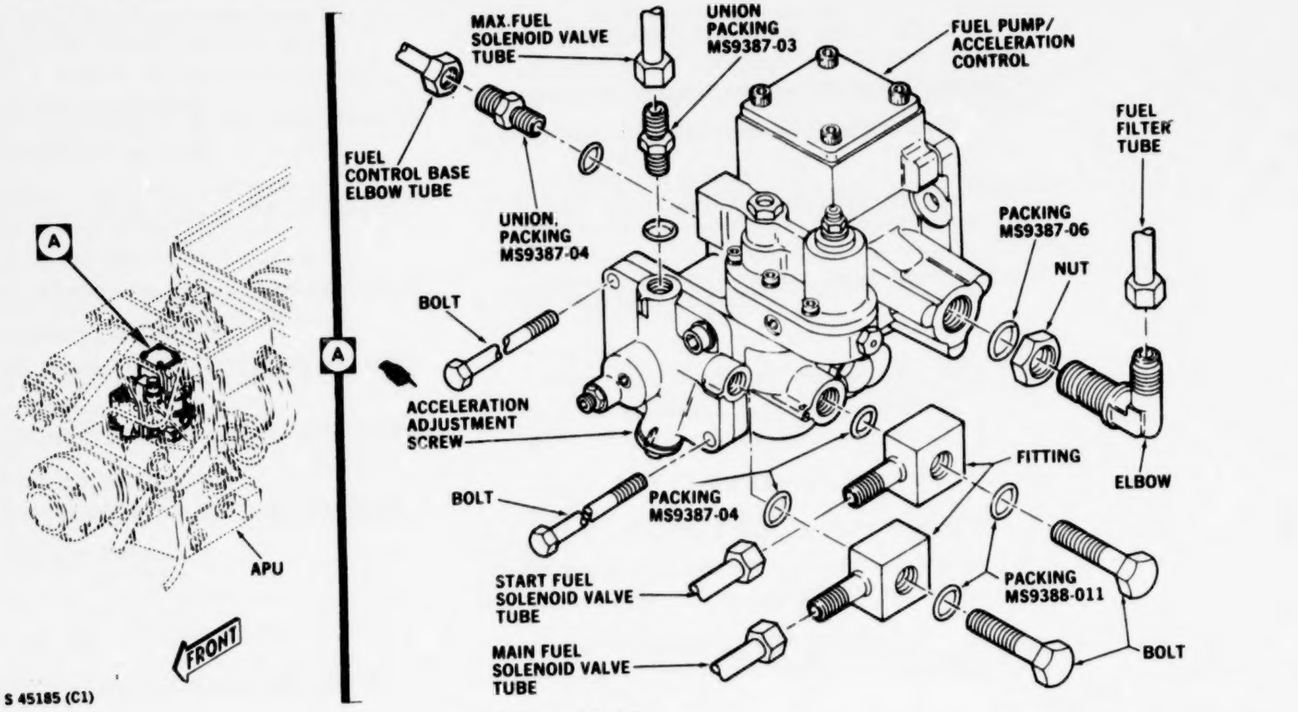

A
APU
FRONT
S 45185 (C1)
A
MAX FUEL SOLENOID VALVE TUBE
UNION PACKING MS9387-03
FUEL PUMP/ ACCELERATION CONTROL
FUEL CONTROL BASE ELBOW TUBE
UNION, PACKING MS9387-04
FUEL FILTER TUBE
PACKING MS9387-06
NUT
BOLT
ACCELERATION ADJUSTMENT SCREW
FITTING
ELBOW
BOLT
PACKING MS9387-04
START FUEL SOLENOID VALVE TUBE
PACKING MS9388-011
MAIN FUEL SOLENOID VALVE TUBE
BOLT

Figure 20-11

STEP 11 REPLACE FUEL PUMP/ACCELERATION CONTROL (CONT)

INSTALL

- Turn off all electrical power.
- Install packings, MS9388-007 and MS9388-029 in bores of replacement fuel pump.
- Attach fuel pump to acceleration control using two bolts and washers.
- Bolt fuel pump/acceleration control to fuel control base and reduction drive assembly.
- Connect tube to elbow on fuel control base and union on acceleration control. Remove tag.
- Connect tubes to solenoid valves, and union and fittings on acceleration control. Remove tags.

CAUTION

Always use a wrench on filter hexnut adjacent to fitting being installed. Restraining filter at the opposite end may overstress filter and cause leakage.

- Connect tube to fuel filter and elbow on fuel pump. Remove tag.
- Prime fuel system (TASK 17). Check for leaks.

NOTE

Before doing following adjustment procedure, make certain all bleed-air ducts are closed and driven equipment is unloaded.

- Start APU (TM 55-1520-237-23-4).

NOTE

Allow APU accumulator time to recharge after each start.

- Shut down APU and allow to coast to a stop.
- Do a second and third start and note time it takes for APU ON light on caution/advisory panel to come on, to reach ready for service (RFS). RFS time of

STEP 11 REPLACE FUEL PUMP/ACCELERATION CONTROL (CONT)

7 to 10 seconds will indicate acceleration control is operating satisfactorily.

- If RFS time is over 10 seconds, check out hydraulic start system (TM 55-1520-237-23-3).
- If RFS time is below 7 to 10 seconds, or hydraulic start system has been corrected, start APU.
- Shut down APU and allow to coast to a stop.
- Restart APU and record time APU takes to reach RFS condition.
- Shut down APU and allow to coast to a stop.

CAUTION

Do not go past adjustments specified below. Mark adjustment screw, before turning, with a grease pencil or equivalent marker.

- Turn acceleration adjustment screw, 1/8-turn counterclockwise.
- Start APU (TM 55-1520-237-23-4) and note time it takes for APU to reach RFS condition.
- If RFS time is less than RFS time recorded before adjustment of acceleration adjustment screw, acceleration control is operating satisfactorily. Allow accumulator to fully charge. Shut down APU and allow to coast to a stop.
- If RFS time did not change, turn acceleration adjustment screw an additional 1/8-turn counterclockwise.
- Restart APU. If RFS time is less than RFS time before second adjustment of acceleration adjustment screw, acceleration control is operating satisfactorily. Allow accumulator to fully charge. Shut down APU.
- If RFS time did not change, replace acceleration control.

STEP 11 REPLACE FUEL PUMP/ACCELERATION CONTROL (CONT)

- Do an operational check of APU and check for leaks (TM 55-1520-237-23-3).
- Make sure fuel control base area is free of foreign objects.
- Install cover and gasket on fuel control base and secure stud fasteners.
- Make sure APU compartment area is free of foreign objects.
- Close and latch APU compartment door.

STEP 12 REPLACE FUEL SOLENOID VALVES

REMOVE

- Turn off all electrical power.
- Unlatch and hinge open APU compartment door.
- Tag each electrical plug to identify related solenoid valve for installation. Disconnect electrical plugs.
- Unlock stud fasteners securing cover to fuel control base. Remove cover and gasket.

CAUTION

Always use a wrench on filter hexnut next to fitting being removed. Restraining filter at the opposite end may overstress filter and cause leakage.

- Disconnect fuel inlet tube from filter and fuel pump to permit valve removal.
- Disconnect tubes from solenoid valves and acceleration control. Tag tubes for location on installation.
- Disconnect tubes from fuel control base at solenoid valves. Tag valves, noting flow direction of arrows indicated on each valve.
- Remove screws and doubler plate from fuel control base and solenoid valves. Remove valves from fuel control base.

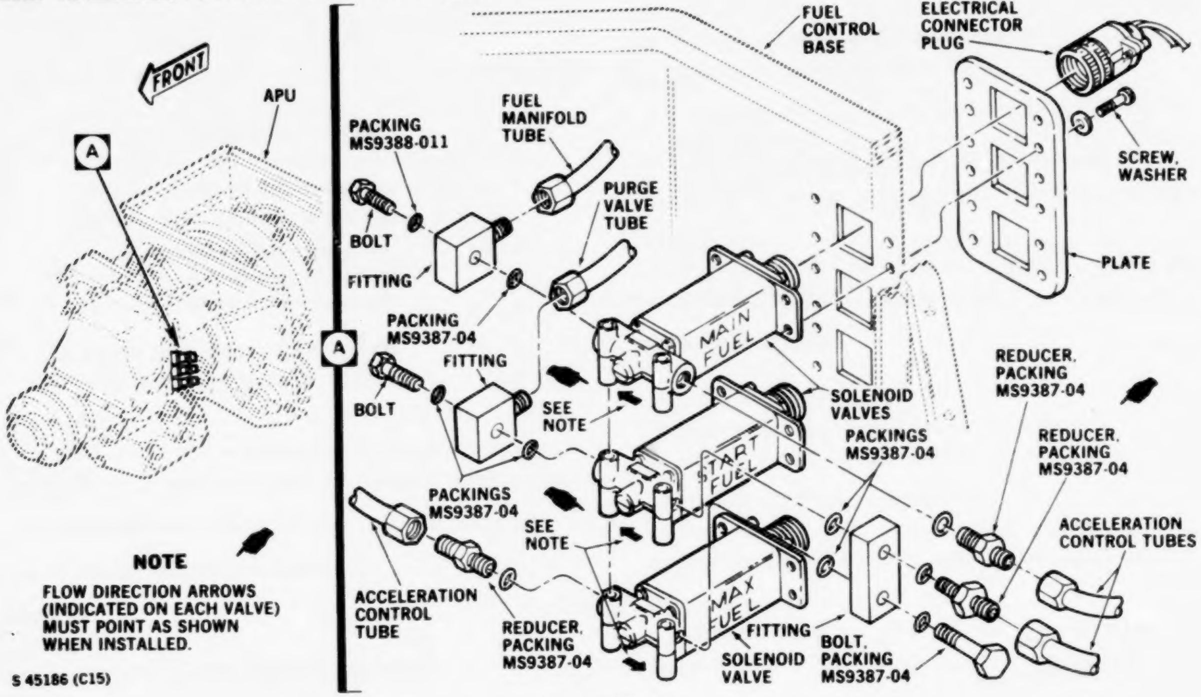
TEARDOWN/BUILDUP

- Remove reducers and/or unbolt fitting from solenoid valves. Remove packings from reducers and fittings.
- Install packings, MS9387-04, on reducers and fittings. Install reducers and/or bolt fittings to solenoid valves.

INSTALL

- Turn off all electrical power.

STEP 12 REPLACE FUEL SOLENOID VALVES (CONT)


FRONT
APU
A
PACKING MS9388-011
FUEL MANIFOLD TUBE
FUEL CONTROL BASE
ELECTRICAL CONNECTOR PLUG
SCREW, WASHER
BOLT
PURGE VALVE TUBE
FITTING
PLATE
PACKING MS9387-04
A
FITTING
MAIN FUEL
SOLENOID VALVES
REDUCER, PACKING MS9387-04
BOLT
SEE NOTE
PACKINGS MS9387-04
START FUEL
REDUCER, PACKING MS9387-04
PACKINGS MS9387-04
SEE NOTE
ACCELERATION CONTROL TUBES
MAX FUEL
ACCELERATION CONTROL TUBE
REDUCER, PACKING MS9387-04
FITTING
SOLENOID VALVE
BOLT, PACKING MS9387-04

NOTE

FLOW DIRECTION ARROWS (INDICATED ON EACH VALVE) MUST POINT AS SHOWN WHEN INSTALLED.

S 45186 (C15)

Figure 20-12

STEP 12 REPLACE FUEL SOLENOID VALVES (CONT)

CAUTION

To prevent a flash fire in the APU compartment, make sure the MAIN, START, and MAX fuel valves are correctly installed per directional flow arrow on each valve.

- Install solenoid valves in fuel control base with the valve directional flow arrows (Figure 20-12) in direction noted on tags.
- Install doubler plate on fuel control base and fasten solenoid valves to plate with screws. Lockwire, MS20995C32, screws.

NOTE

Single strand of lockwire, MS20995C32, is acceptable.

STEP 12 REPLACE FUEL SOLENOID VALVES (CONT)

- Connect tubes (purge and manifold) from fuel control base to solenoid valves. Remove tags.
- Connect tubes to solenoid valves and acceleration control as noted on tags. Remove tags.

CAUTION

Always use a wrench on filter hexnut next to fitting being installed. Restraining filter at the opposite end may overstress filter and cause leakage.

- Connect fuel inlet tube to fuel pump and filter.
- Connect electrical plugs to solenoid valves as noted on tags. Lockwire, MS20995C20, plugs. Remove tags.
- Do an operational check of solenoid valves and check for leaks (TM 55-1520-237-23-3).
- Make sure fuel control base area is free of foreign objects.
- Install cover and gasket on fuel control base and secure by locking stud fasteners.
- Make sure AFU compartment area is free of foreign objects.
- Close and latch APU compartment door.

STEP 13 REPLACE PURGE VALVE

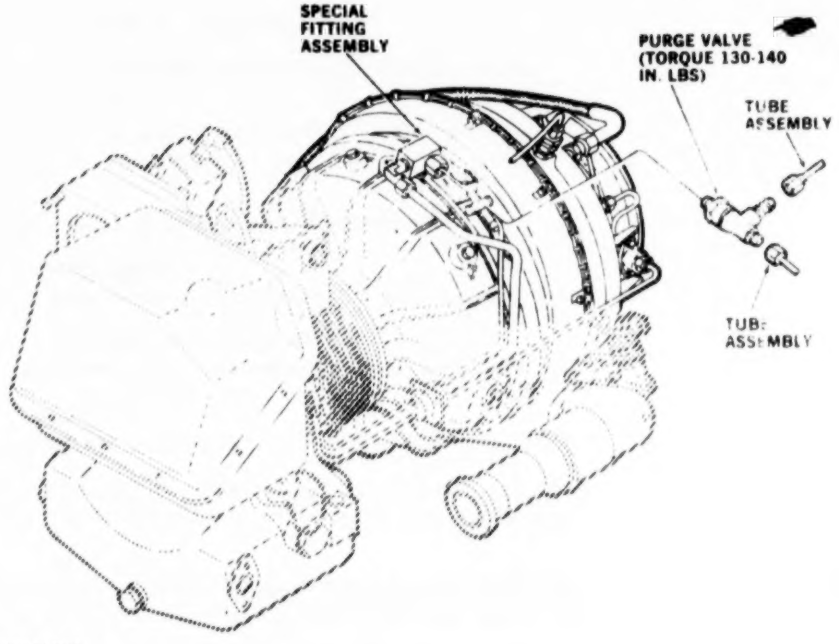
REMOVE

- Turn off all electrical power.
- Unlatch and hinge open APU compartment door.
- Disconnect fuel lines from purge valve.
- Remove purge valve from special fitting assembly.
- Tap valve against hand. Valve should rattle. Replace as necessary.

INSTALL

- Turn off all electrical power.
- Connect purge valve to special fitting assembly.

  TORQUE TO 130 - 140 INCH-POUNDS.
- Connect fuel lines to purge valve. Tighten lines to 1/3 turn past point where sharp rise in torque is felt.
- Do an operational check and check for leaks (TM 55-1520-237-23-3).
- Make sure APU compartment area is free of foreign objects.
- Close APU compartment door.


SPECIAL FITTING ASSEMBLY
PURGE VALVE (TORQUE 130-140 IN. LBS)
TUBE ASSEMBLY
TUBE ASSEMBLY

S 45187 (C1)

Figure 20-13

STEP 14 REPLACE START NOZZLE

REMOVE

- Turn off all electrical power.
- Unlatch and hinge open APU compartment door.
- Disconnect start fuel line from start nozzle and holder.
- Remove start nozzle and holder.
- Inspect for carbon or other contamination. Replace start nozzle if carbon or other contamination that would obstruct fuel flow is found.

INSTALL

- Turn off all electrical power.
- To install start fuel nozzle 160238-200, do this:
  - Except for first two threads, apply antiseize compound, MIL-A-907, to threads of nozzle holder that mate with combustor housing.

NOTE

You may replace adjustable start fuel nozzle (160238-100 or 160238-100A) with either another adjustable nozzle, or a fixed start fuel nozzle (160238-200); however, do not replace fixed start fuel nozzle with adjustable nozzle.

STEP 14 REPLACE START NOZZLE (CONT)

- Install nozzle in combustor housing. **TORQUE NOZZLE TO 95 - 105 INCH-POUNDS.**

- To install start fuel nozzle 160238-100 or 160238-100A, do this:
  - Except for first two threads, apply anti-seize compound, MIL-A-907, to threads of nozzle holder that mate with combustor housing.

CAUTION

To prevent a flash fire in the APU compartment due to misadjusted start nozzle, make sure that the nozzle tip bottoms out against the combustor housing before making nozzle adjustment.

  - Install start nozzle holder in combustor liner hole until nozzle tip lightly bottoms out against conbustor housing. Back out nozzle 2 - 2 1/2 turns. Torque jamnut to 35 - 40 inch-pounds (Figure 20-14, Detail A).

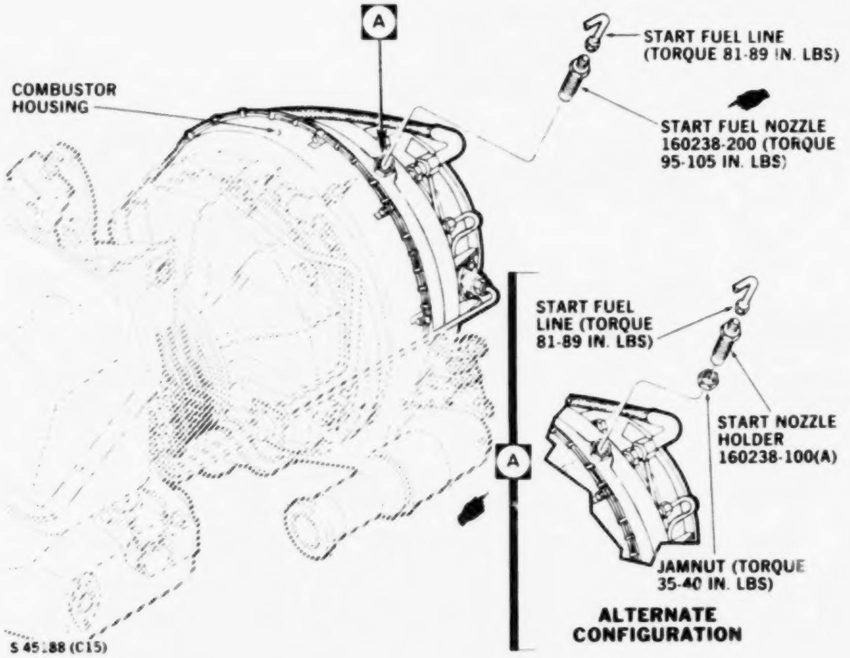

A
START FUEL LINE (TORQUE 81-89 IN. LBS)
COMBUSTOR HOUSING
START FUEL NOZZLE 160238-200 (TORQUE 95-105 IN. LBS)
START FUEL LINE (TORQUE 81-89 IN. LBS)
START NOZZLE HOLDER 160238-100(A)
A
JAMNUT (TORQUE 35-40 IN. LBS)
ALTERNATE CONFIGURATION
S 45188 (C15)

Figure 20-14

STEP 14 REPLACE START NOZZLE (CONT)

- Deleted
- Connect start fuel line to start nozzle holder. **TORQUE TO 81 - 89 INCH-POUNDS.**
- Do an operational check and check for leaks (TM 55-1520-237-23-3).
- Make sure APU compartment is free of foreign objects.
- Close and latch APU compartment door.

STEP 15 REPLACE IGNITION CABLE

REMOVE

- Turn off all electrical power.
- Unlatch and open APU compartment door.
- Remove clamp.
- Remove bolts and washers securing sleeve to firewall.
- Remove old sealant from sleeve and firewall with a non-metallic scraper.
- Disconnect APU electrical harness from upper end of ignition exciter.
- Disconnect ignition cable from spark plug and ignition exciter.
- Inspect for frayed wire braids, and corroded or damaged connectors. Replace ignition cable if frayed wire braids, or corroded or damaged connectors are found.

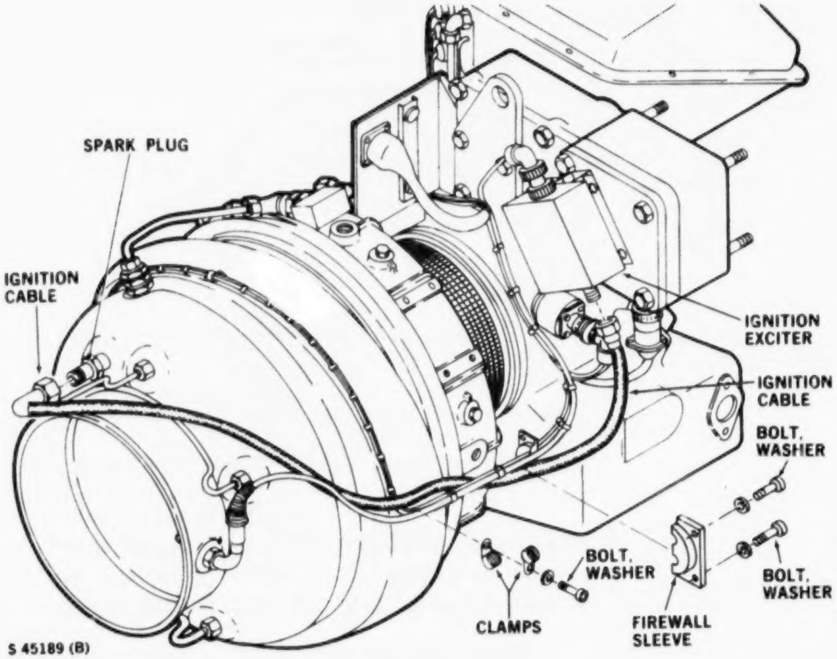

SPARK PLUG
IGNITION CABLE
IGNITION EXCITER
IGNITION CABLE
BOLT, WASHER
BOLT, WASHER
BOLT, WASHER
CLAMPS
FIREWALL SLEEVE
S 45189 (B)

Figure 20-15

STEP 15 REPLACE IGNITION CABLE (CONT)

INSTALL

- Turn off all electrical power.
- Connect ignition cable to ignition exciter and spark plug. Lockwire, MS20995C20, cable to exciter and spark plug.
- Install clamp.
- Install sleeve on firewall with four bolts and washers. Apply sealant, RTV106, to sleeve. Lockwire, MS20995NC32, bolts.
- Connect APU electrical harness to ignition exciter. Lockwire, MS20995C20, harness to exciter.
- Check ignition cable and APU electrical harness for contact. If contact occurs reposition ignition cable and/or APU electrical harness. Fasten with extra clamps as required.
- Do an operational check (TM 55-1520-237-23-3).
- Make sure APU compartment is free of foreign objects.
- Close and latch APU compartment door.

STEP 16 REPLACE FUEL MANIFOLD

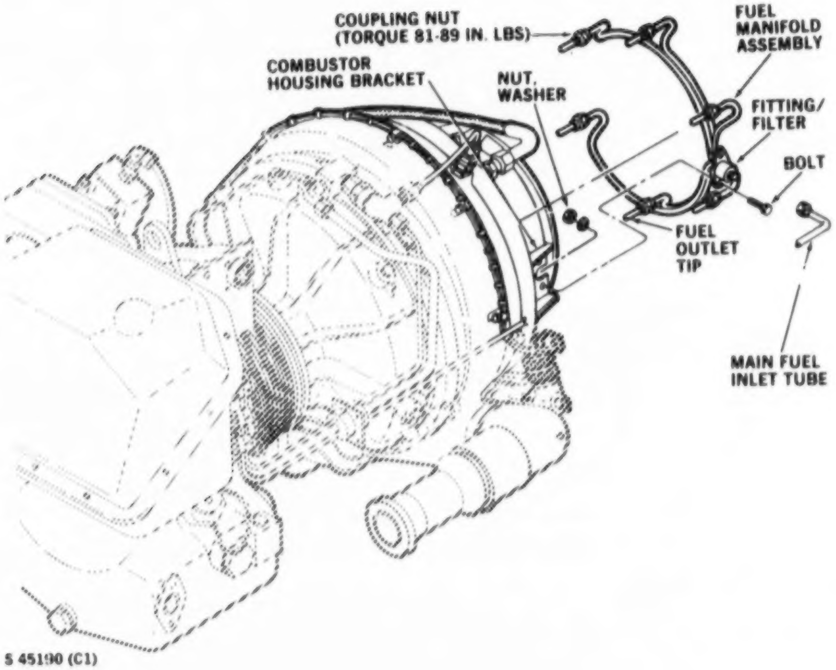
REMOVE

- Turn off all electrical power.
- Unlatch and open APU compartment door.
- Remove APU from helicopter (TASK 19).
- Remove spark plug (STEP 7).
- Remove main fuel inlet tube from fitting/filter.
- Remove bolts and nuts securing fitting/filter assembly to combustor housing mounting bracket.

CAUTION

Be careful when handling fuel manifold to prevent denting, bending, or breaking brazed joints. Also, take care not to bend fuel outlet tips when removing manifold.

- Loosen and back off each coupling nut holding manifold outlet tips in combustor housing. Carefully and evenly pull off manifold assembly.
- Place fuel manifold assembly in a clean protected area so it will not become dirty or damaged.


COUPLING NUT
(TORQUE 81-89 IN. LBS)
FUEL MANIFOLD ASSEMBLY
COMBUSTOR HOUSING BRACKET
NUT, WASHER
FITTING/FILTER
BOLT
FUEL OUTLET TIP
MAIN FUEL INLET TUBE

S 45190 (C1)

Figure 20-16

STEP 16 REPLACE FUEL MANIFOLD (CONT)

- Inspect fuel manifold for cracks at brazed joints, bent fuel injector tips, and for heavy carbon deposits. Replace manifold at brazed joints if cracked, or if it has bent fuel injector tips, or carbon deposits that would obstruct fuel flow.

INSTALL

- Lightly coat each fuel outlet tip of manifold assembly with lubricating oil, MIL-L-23699.
- Carefully insert fuel outlet tips of manifold assembly into tube fittings on combustor housing.
- Install packing, MS9388-016 on fitting/filter assembly.
- Position manifold fitting/filter assembly onto combustor housing mounting bracket. Secure with bolts, washers, and nuts.
- Make sure manifold assembly is properly positioned. Apply antiseize compound, MIL-A-907, to coupling nuts. **TORQUE COUPLING NUTS NO MORE THAN 81 - 89 INCH-POUNDS.**
- Install main fuel inlet tube on fitting/filter. Tighten nut 1/6 to 1/3 turn beyond point where sharp rise in torque is felt.
- Install spark plug (STEP 7).
- Install APU (TASK 19).
- Do an operational check and check for leaks (TM 55-1520-237-23-3).
- Make sure APU compartment is free of foreign objects.
- Close and latch APU compartment door.

STEP 17 REPLACE IGNITION EXCITER

REMOVE

- Turn off all electrical power
- Unlatch and hinge open APU compartment door.
- Disconnect APU electrical harness from upper end of ignition exciter.
- Disconnect ignition cable from lower end of ignition exciter.
- Unbolt and remove ignition exciter.

INSTALL

- Turn off all electrical power.
- Install ignition exciter on APU with bolts, washers, and nuts.
- Connect ignition cable to lower end of exciter. Lockwire cable to exciter, MS20995C20.
- Connect APU electrical harness to exciter. Lockwire harness to exciter MS20995C20.

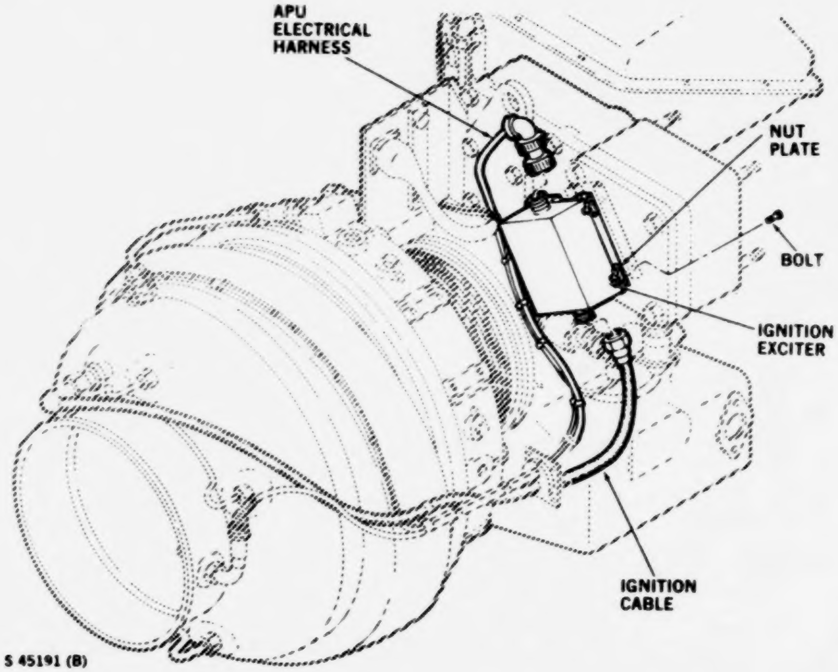

APU ELECTRICAL HARNESS
NUT PLATE
BOLT
IGNITION EXCITER
IGNITION CABLE
S 45191 (B)

Figure 20-17

STEP 17 REPLACE IGNITION EXCITER (CONT)

- Make sure APU compartment is free of foreign objects.
- Close and latch APU compartment door.
- Do an operational check (TM 55-1520-237-23-3).

STEP 18 REPLACE SPEED SENSOR

REMOVE

- Turn off all electrical power.
- Unlatch and hinge open both APU compartment doors.
- Disconnect electrical plug from speed sensor.
- Remove speed sensor from reduction drive housing.

INSTALL

- Manually turn generator to turn gear train of reduction drive assembly, until gear tooth is in line with center of 5/8-inch threaded hole.
- Apply Loctite compound, #69, to threads of speed sensor. Install sensor in hole until sensor pole piece lightly bottoms on gear tooth (gear outside diameter).
- Back off sensor about 1/4 turn (0.014-inch). Use key in electrical connector as index. This gives 0.012- 0.016-inch gap between sensor pole piece and gear tooth.

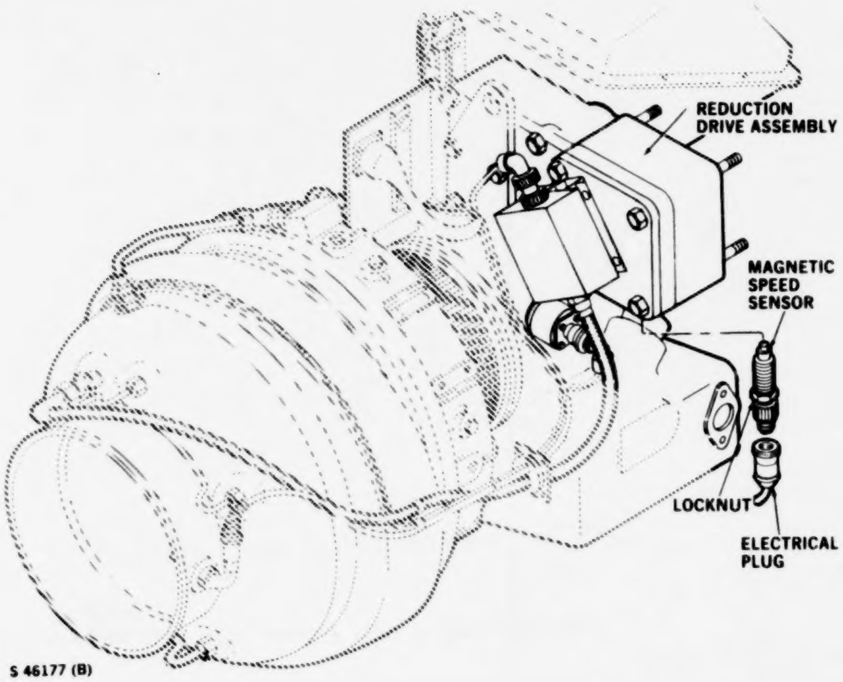

REDUCTION DRIVE ASSEMBLY
MAGNETIC SPEED SENSOR
LOCKNUT
ELECTRICAL PLUG
S 46177 (B)

Figure 20-18

STEP 18 REPLACE SPEED SENSOR (CONT)

- While holding speed sensor firmly, tighten locknut to securely hold sensor in position.

- Connect electrical plug to sensor. Lockwire, MS20995C20, plug to sensor.

- Do an operational check (TM 55-1520-237-23-3)

- Make sure APU compartment is free of foreign objects.

- Close and latch APU compartment doors.

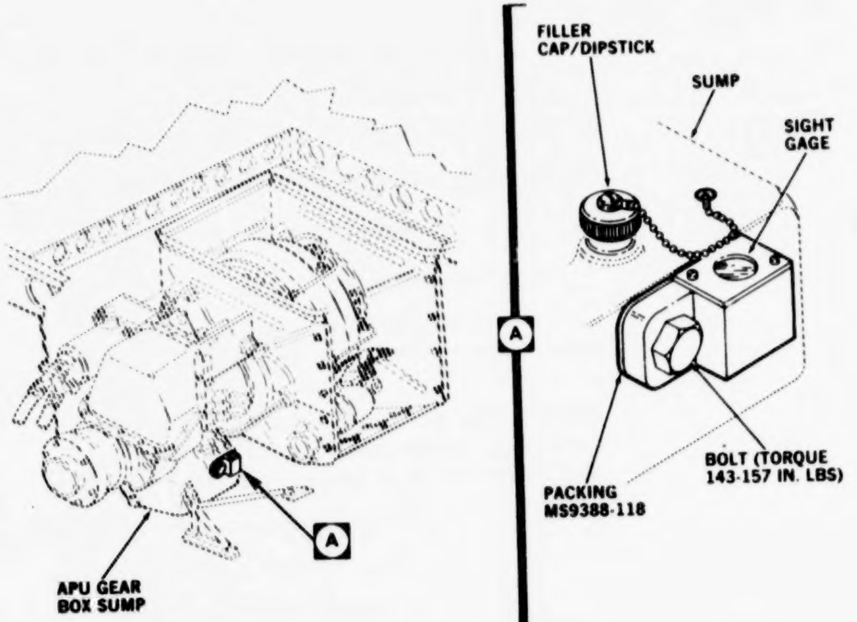
STEP 19 REPLACE OIL LEVEL SIGHT GAGE

REMOVE

- Turn off all electrical power.
- Drain oil from APU gear box sump.
- Unlatch and open APU compartment door. Remove bolt, sight gage, and packing.

INSTALL

- Install sight gage, with packing MS9388-118, at side of gear box sump. **TORQUE BOLT TO 143 - 157 INCH-POUNDS.**
- Service APU (TASK 19).
- Do operational check and check for oil leaks (TM 55-1520-237-23-3).
- Make sure APU compartment is free of foreign objects.
- Close and latch APU compartment door.


APU GEAR BOX SUMP
A
A
FILLER CAP/DIPSTICK
SUMP
SIGHT GAGE
BOLT (TORQUE 143-157 IN. LBS)
PACKING MS9388-118

S 46178 (B)

Figure 20-19

STEP 20 REPLACE ELECTRICAL HARNESS/ THERMOCOUPLE

REMOVE

- Turn off all electrical power.
- Unlatch and hinge open APU compartment door.
- Remove APU from helicopter (TASK 19).
- Disconnect electrical plug from fuel solenoid valves, oil temperature switch, oil pressure switch, speed sensor, ignition exciter and start bypass valve.
- Disconnect thermocouple from APU boss.
- Remove clamps.
- Carefully remove electrical harness/thermocouple.

INSTALL

- Turn off all electrical power.
- Lay in electrical harness.
- Install clamps as shown.
- Connect electrical harness plugs to start bypass valve, ignition exciter, speed sensor, oil pressure switch, oil temperature switch and three solenoid valves.
- Thread thermocouple into boss on APU. Lockwire, MS20995C20, thermocouple to boss.
- Lockwire MS20995C32, all connectors.
- Install APU in helicopter (TASK 19).
- Do an operational check (TM 55-1520-237-23-3).
- Make sure APU compartment area is free of foreign objects.
- Close and latch APU compartment door.

STEP 20 REPLACE ELECTRICAL HARNESS/THERMOCOUPLE (CONT)

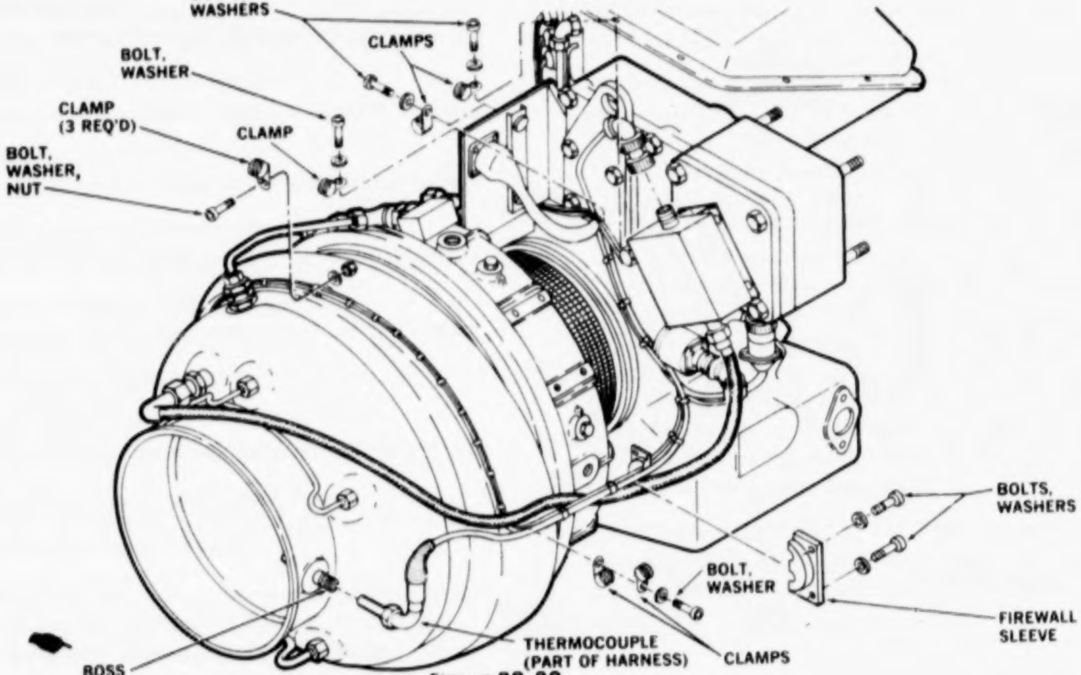
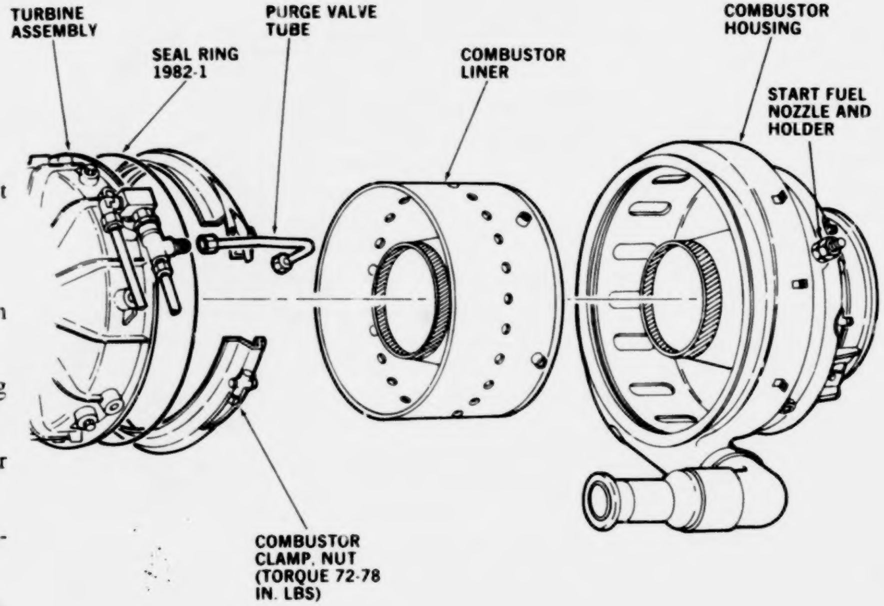

BOLTS, WASHERS
CLAMPS
BOLT, WASHER
CLAMP (3 REQ'D)
CLAMP
BOLT, WASHER, NUT
BOLTS, WASHERS
BOLT, WASHER
FIREWALL SLEEVE
THERMOCOUPLE (PART OF HARNESS)
CLAMPS
BOSS
S 46186

Figure 20-20

STEP 21 REPLACE COMBUSTOR HOUSING

REMOVE

- Turn off all electrical power.
- Remove APU from helicopter (TASK 19).
- Remove shroud assembly from around APU hot section (STEP 2).
- Remove start bypass valve (STEP 8).
- Disconnect spark plug and electrical plug from ignition exciter.
- Remove thermocouple from combustor housing (STEP 20).
- Disconnect tube between start fuel nozzle holder and purge valve. Cap fittings.
- Disconnect tube bundle from fuel manifold assembly (STEP 25). Cap fittings.
- Loosen clamp securing combustor housing to turbine assembly.
- Match mark combustor housing and turbine assembly at air inlet housing.


TURBINE ASSEMBLY
SEAL RING 1982-1
PURGE VALVE TUBE
COMBUSTOR LINER
COMBUSTOR HOUSING
START FUEL NOZZLE AND HOLDER
COMBUSTOR CLAMP, NUT (TORQUE 72-78 IN. LBS)

S 46180 (B)

Figure 20-21

STEP 21 REPLACE COMBUSTOR HOUSING (CONT)

- Attach combustor puller tool, ST-91125 and adapter, ST-93014 to combustor housing using exhaust pipe clamp.
- Remove combustor section from turbine assembly.
- Remove seal ring.

WARNING

Products of combustion may be poisonous. Avoid getting exhaust deposits in open wounds.

- Place combustor section, exhaust end down, on clean work area.
- Separate combustor line from combustor housing (STEP 22).
- Inspect for cracks, tears, holes, flange distortion, bulges. Replace combustor housing if damaged.

INSTALL

- Install combustor liner on combustor housing (STEP 22).
- Position combustor clamp over aft section of turbine assembly. Do this before mating turbine assembly with combustor housing.

CAUTION

Always line up match marks on turbine assembly and combustor housing when mating these parts. Make sure that combustor drain valve boss is in line with oil drain plug on reduction drive. Never turn combustor housing after mating with turbine assembly; damage may result to seal ring. Correct alignment will also prevent damage to fuel tube assemblies.

- Mate combustor housing and seal ring with turbine assembly. Tap in place with combustor puller tool, ST-91125. Secure in place with combustor clamp.

STEP 21 REPLACE COMBUSTOR HOUSING (CONT)

- Tap combustor housing two or three times with combustor removal tool, ST-91125. **TORQUE COMBUSTOR CLAMP NUT TO 72 - 78 INCH-POUNDS.**
- Connect fuel tube to fuel manifold.
- Connect tube between purge valve and start fuel nozzle holder.
- Install thermocouple (STEP 20).
- Connect electrical plug to spark plug and ignition exciter. Lockwire, MS20995C32, plugs.
- Install start bypass valve (STEP 8).
- Install shroud assembly around APU hot section (STEP 2).
- Install APU in helicopter (TASK 19).

STEP 22 REPLACE COMBUSTER LINER/SEALS

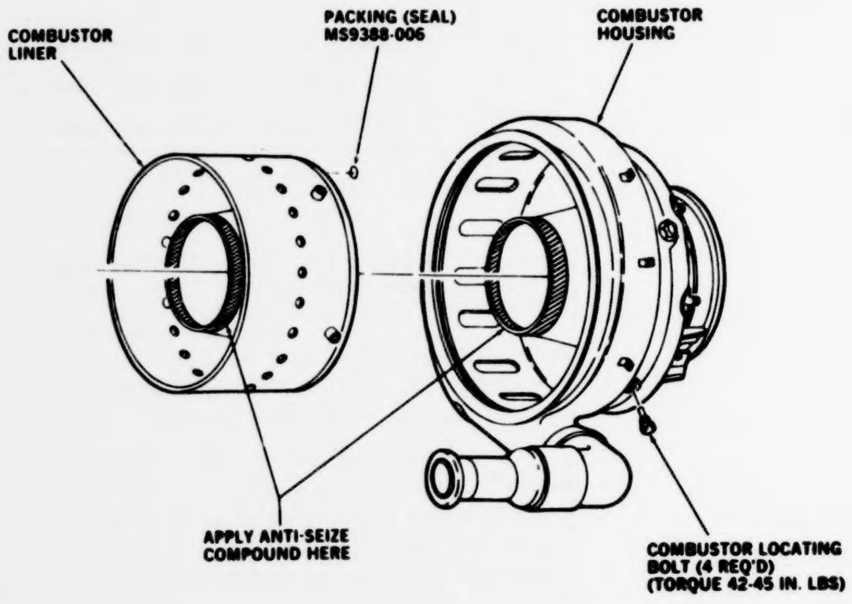
REMOVE COMBUSTOR LINER

- Turn off all electrical power.
- Remove APU from helicopter (TASK 19).
- Remove shroud assembly from around APU hot section (STEP 2).
- Remove combustor housing (STEP 21).

CAUTION

Always remove fuel manifold assembly, start fuel nozzle, thermocouple and spark plug before removing combustor liner from combustor housing. These parts protrude into combustor liner. Attempted removal of liner with these parts installed will result in serious damage.

- Remove fuel manifold assembly from combustor housing (STEP 16).
- Remove start fuel nozzle (STEP 14).
- Remove spark plug (STEP 7).


COMBUSTOR LINER
PACKING (SEAL) MS9388-006
COMBUSTOR HOUSING
APPLY ANTI-SEIZE COMPOUND HERE
COMBUSTOR LOCATING BOLT (4 REQ'D) (TORQUE 42-45 IN. LBS)

S 46184 (B)

Figure 20-22

STEP 22 REPLACE COMBUSTOR LINER/SEALS (CONT)

- Remove fuel drain valve (STEP 9).
- Remove combustor liner locating bolts.
- Separate combustor liner from combustor housing.
- Remove packing (seals) from combustor liner.
- Inspect for cracks, tears, holes, flange distortion, bulges and combustion deposits in venturi adjacent to U-tube. Replace combustor liner if damaged.

INSTALL COMBUSTOR LINER

- Lubricate replacement packings, MS9388-006, with a light coat of lubricating oil, MIL-L-23699.
- Install packings, MS9388-006, into fittings of combustor liner. Use a small, blunt-ended punch.
- Insert a 1/8-inch-diameter steel rod with tapered end into fuel injector bosses to be sure packings are properly seated in liner fittings.
- Apply a light coating of anti-seize compound, MIL-A-907, to combustor locating bolts and to threads of spark plug, start fuel nozzle, thermocouple and fuel drain valve. Also apply to mating surfaces of combustor housing and liner.
- With combustor housing in vertical position (exhaust end down), position combustor liner in combustor housing. Line up start fuel nozzle and spark plug holes.
- Install locating bolts. **TORQUE BOLTS TO 42 - 45 INCH-POUNDS.**
- Install fuel drain valve (STEP 9).
- Install spark plug (STEP 7).
- Install start fuel nozzle (STEP 14).
- Install fuel manifold assembly (STEP 16).
- Install combustor housing (STEP 21).

STEP 22 REPLACE COMBUSTOR LINER/SEALS (CONT)

- Install shroud assembly around APU hot section (STEP 2).
- Install APU in helicopter (TASK 19).

REMOVE SEALS (PACKINGS)

- Turn off all electrical power.
- Remove APU from helicopter (TASK 19).
- Remove shroud assembly from around APU hot section (STEP 2).
- Remove combustor housing (STEP 21).
- Remove and discard packings. Cover all openings.

INSTALL SEALS (PACKINGS)

- Turn off all electrical power.
- Lubricate replacement packings, MS9388-006, with light coat of lubricating oil, MIL-L-23699.
- Install packings, MS9388-006, into fittings of combustor liner.
- Install combustor liner, into combustor housing.
- Install combustor housing to turbine assembly (STEP 21).
- Install shroud assembly around APU hot section (STEP 2).
- Install APU in helicopter (TASK 19).

STEP 23 REPLACE OIL TEMPERATURE SWITCH

REMOVE

- Turn off all electrical power.
- Unlatch and hinge open APU compartment door.
- Remove APU from helicopter (TASK 19).
- Disconnect electrical plug from oil temperature switch.
- Drain oil from APU gear box sump by removing oil drain cover.
- Remove oil temperature switch from gear box sump.
- Remove packing from oil temperature switch.

INSTALL

- Turn off all electrical power.
- Lubricate packing, MS9387-05, with lubricating oil, MIL-L-23699. Install packing on oil temperature switch.
- Install oil temperature switch on APU sump. Lockwire, MS20995C32, oil temperature switch to APU.
- Connect electrical plug to oil temperature switch. Lockwire, MS20995C20, plug to switch.
- Install APU in helicopter (TASK 19).
- Do an operational check (TM 55-1520-237-23-3).
- Make sure APU compartment is free of foreign objects.
- Close and latch APU compartment door.

STEP 23 REPLACE OIL TEMPERATURE SWITCH (CONT)

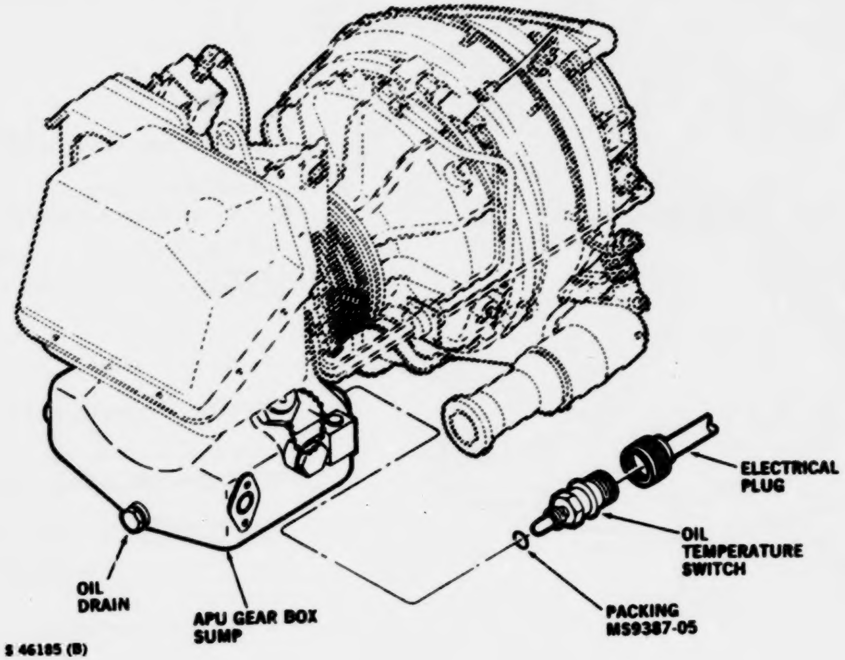

ELECTRICAL PLUG
OIL TEMPERATURE SWITCH
PACKING MS9387-05
OIL DRAIN
APU GEAR BOX SUMP
S 46185 (B)

Figure 20-23

STEP 24 REPLACE AIR INLET SCREEN

REMOVE

- Turn off all electrical power.
- Unlatch and hinge open APU compartment door.
- Remove lockwire, then spread and remove air inlet screen.
- Inspect for broken wires or distortion. Replace as necessary.

INSTALL

- Install air inlet screen. Lockwire, MS20995C32, the air inlet screen ends.
- Make sure APU compartment area is free of foreign objects.
- Close and latch APU compartment door.

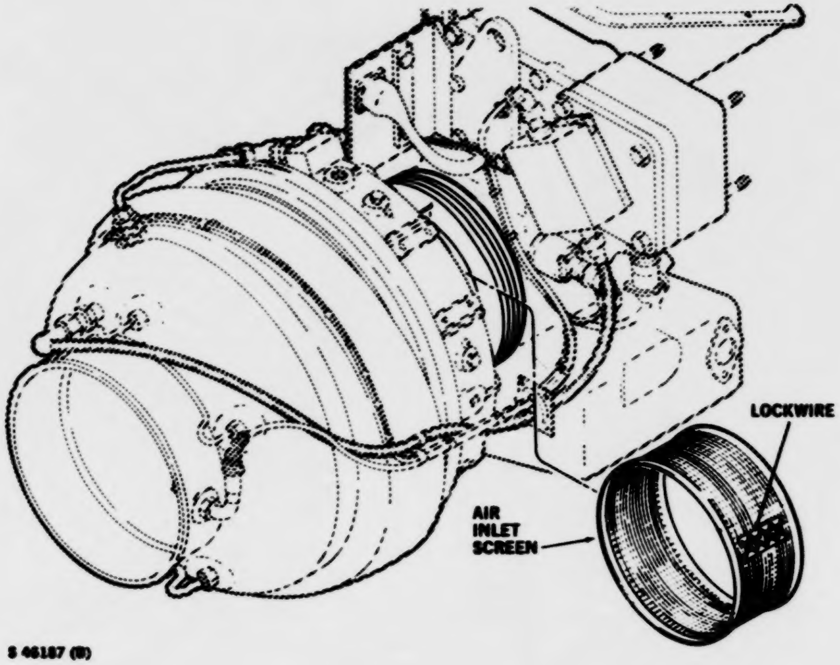


Figure 20-24

STEP 25 REPLACE TUBE BUNDLE

REMOVE

- Turn off all electrical power.
- Unlatch and hinge open APU compartment door.
- Loosen and back off coupling nuts securing tube bundle ends to fuel manifold assembly, purge valve, and special fitting.
- Unlatch stud fasteners and remove cover from fuel control base.
- Loosen and back off coupling nuts securing tube bundle to start and main fuel solenoid valves.
- Loosen and back off coupling nut securing tube bundle to fuel control base elbow.
- Carefully remove tube bundle from fuel control base and APU.
- Remove packings from tube bundle.

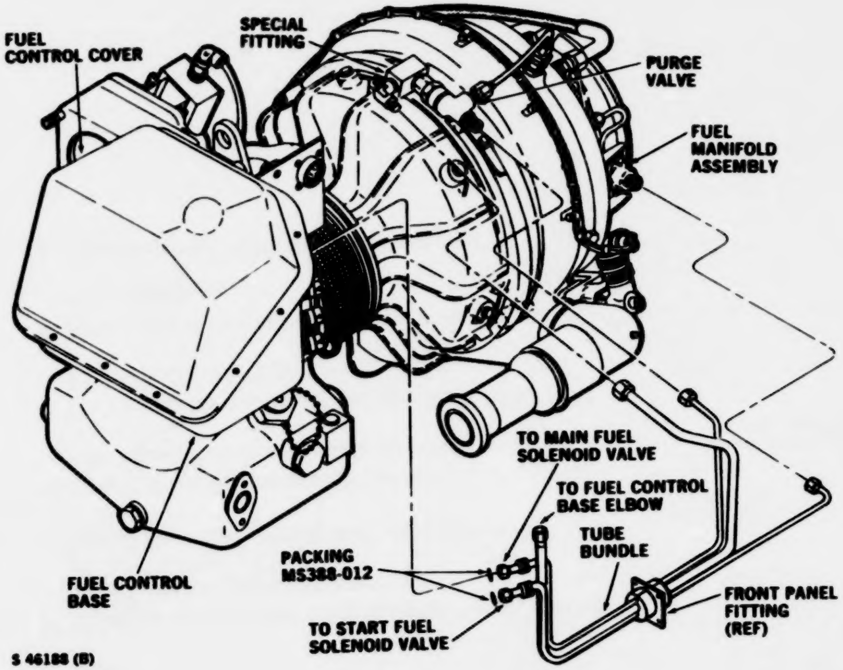

FUEL CONTROL COVER
SPECIAL FITTING
PURGE VALVE
FUEL MANIFOLD ASSEMBLY
TO MAIN FUEL SOLENOID VALVE
TO FUEL CONTROL BASE ELBOW
TUBE BUNDLE
PACKING MS388-012
FUEL CONTROL BASE
FRONT PANEL FITTING (REF)
TO START FUEL SOLENOID VALVE
S 46188 (B)

Figure 20-25

STEP 25 REPLACE TUBE BUNDLE (CONT)

INSTALL

- Turn off all electrical power.
- Lubricate packings, MS9388-012, with lubricating oil, MIL-L-23699, then install packings on tube bundle ends (start fuel solenoid tube and main fuel solenoid tube).
- Unlatch stud fasteners and remove fuel control cover.
- Carefully insert both tube ends through fuel control base openings.
- Connect tube ends to start and main fuel solenoid valves.
- Connect tube bundle end to fuel control enclosure elbow.
- Connect tube bundle ends to purge valve, special fitting and fuel manifold assembly.
- Install fuel control cover with stud fasteners.
- Check tubes for contact. If contact occurs reposition tubes. Fasten with extra clamps as required.
- Do an operational check and check for leaks (TM 55-1520-237-23-3).
- Make sure APU compartment area is free of foreign objects.
- Close and latch APU compartment door.

STEP 26 REPLACE SPLINE ADAPTER

REMOVE

- Loosen clamp bolt on QAD mount clamp and remove generator from mount.

NOTE

Move generator only far enough to get to spline adapter.

- Move and support generator to get to spline adapter.

CAUTION

Do not hammer or tap spline adapter, and this may damage APU.

NOTE

A damaged spline adapter can be seen only after the generator has been removed.

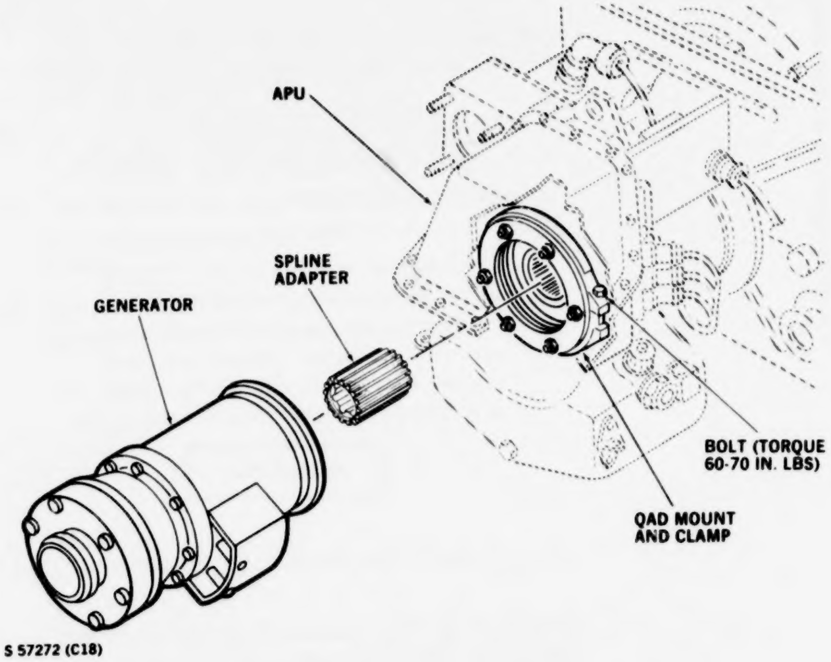

APU
SPLINE ADAPTER
GENERATOR
BOLT (TORQUE 60-70 IN. LBS)
QAD MOUNT AND CLAMP
S 57272 (C18)

Figure 20-26

STEP 26 REPLACE SPLINE ADAPTER (CONT)

- Remove spline adapter using puller.
- If splines in output drive gear are damaged, replace APU.
- Remove any broken pieces of spline adapter using machinist's scribe.

INSTALL

CAUTION

Do not hammer or tap spline adapter, as this may damage APU.

- Press tapered end of spline adapter onto output drive gear splines with pusher/puller and 7/16-inch socket.
- Recess face of spline adapter up to, but not more than 1/8-inch, from APU output drive spline front face.

NOTE

Deleted.

- Check for foreign objects.
- Coat groove in QAD mount clamp with a light coat of antiseize compound, Fed. Spec MIL-A-907.
- Coat generator drive spline with grease, MIL-G-81827.

CAUTION

- To make sure of positive QAD mount clamp engagement completely around generator flange, support generator flush against QAD mount while tightening clamp bolt. Failure to do so can result in cracks in generator housing and flange damage.
- Make sure generator drive spline properly engages drive spline adapter of APU, to prevent pushing adapter out of drive spline and into gear box.

- Place generator flat against QAD mount surface. Turn generator to position wires and terminals in lower right quadrant.

STEP 26 REPLACE SPLINE ADAPTER (CONT)

NOTE

The generator drive shaft will float in its support to allow for normal misalignment during installation. The shaft may be offcenter up to 1/16 inch, making it appear that it is bent, or not lined up. The shaft will center itself with the APU drive when the generator is installed.

- Check clamp for proper engagement with generator and QAD mount flange. **TORQUE CLAMP BOLT TO 60 - 70 INCH-POUNDS.**
- Tap lightly around clamp circumference with mallet. **RETORQUE BOLT TO 60 INCH-POUNDS.**
- Continue tapping clamp until two successive trials show no loss in torque reading from 60 inch-pounds.
- Lockwire, MS20995NC20, clamp bolt after making certain generator is properly attached.

TASK 21
APU - REPAIR (AVIM)

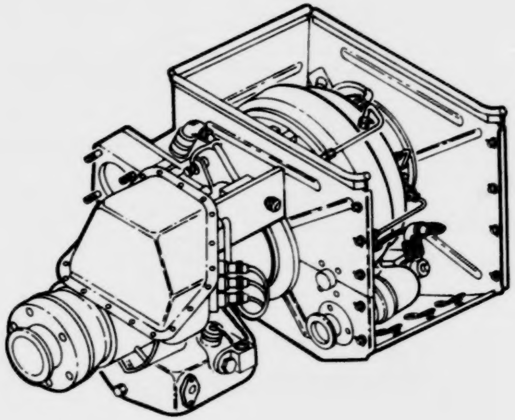
- **REPLACE START MOTOR AND GENERATOR DRIVE PAD OIL SEAL - STEP 1**
- **REPLACE INSERTS, STUDS, AND LOCKRINGS - STEP 2**

MANPOWER
- One Man Required: MOS 68B - Aircraft Powerplant Repairer

SUPPLIES
- Lubricating Oil, MIL-L-23699 (STEP 1)
- Oil Seal, 451100SJ - (FSCM 55820) (1 Required, STEP 1)
- Oil Seal, 481267-HGA (FSCM 55820) (1 Required, STEP 1)

TOOLS
- Insert Removal Kit, NSN 518-00-778-3789
- Machinist's Scribe, NSN 5120-00-221-7063
- Engine and Powertrain Repairman's Toolkit, NSN 5180-00-323-4944
- Seal Driver, 90889-01 and -04 (FSCM 55820) (STEP 1)

ALSO NEEDED
- TASK 19 (STEP 2)
- TM 55-1500-204-25/1 (STEP 2)
- TM 55-1520-237-23-3



S 45194 (B)

STEP 1 REPLACE START MOTOR AND GENERATOR DRIVE PAD OIL SEAL

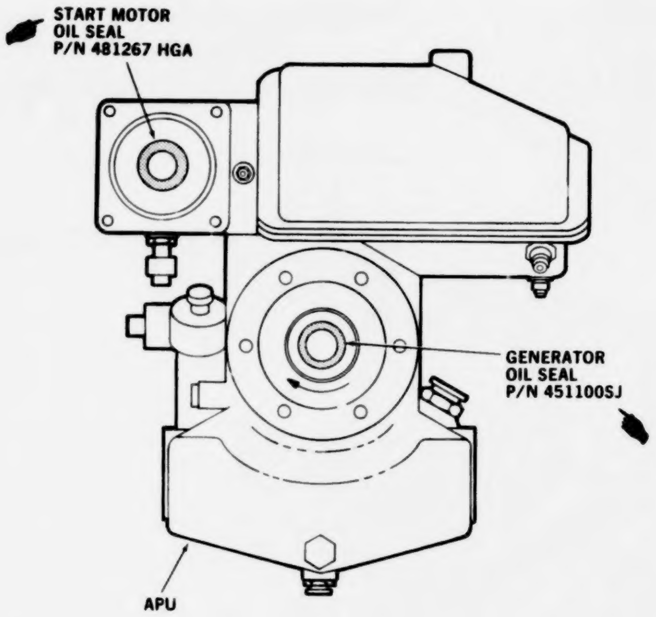
REMOVE

- Turn off all electrical power.
- Unlatch and hinge open APU compartment door.

CAUTION

- To prevent an oil leak, be careful not to nick shaft or sealing surface of drive pad bore when removing seal.

- Insert a machinist's scribe, NSN 5120-00-221-7063, or equivalent tool between metal and rubber part of seal and pry seal slowly from bore. When seal is out of bore far enough to grip with needlenose pliers, pull seal from APU with pliers.


START MOTOR
OIL SEAL
P/N 481267 HGA
GENERATOR
OIL SEAL
P/N 451100SJ
APU

S 45195 (C18)

Figure 21-1

STEP 1 REPLACE START MOTOR AND GENERATOR DRIVE PAD OIL SEAL (CONT)

INSTALL

- Lubricate seal inner lip with lubricating oil, MIL-L-23699.
- Using driver tool, 90889-01 or -04, install seal, 451100-SJ or 481267-HGA, until it bottoms against shoulder of APU bore. Be careful to prevent damage to seal and contact surface.
- Do an operational check and inspect for leaks (TM 55-1520-237-23-3).
- Make sure APU compartment area is free of foreign objects.
- Close and latch APU compartment door.

STEP 2 REPLACE INSERTS, STUDS, AND LOCK RINGS

- Turn off all electrical power.
- If necessary, remove APU from helicopter (TASK 19).

NOTE

Instructions here for removal and installation are general. Detailed instructions and techniques are in TM 55-1500-204-25/1.

REMOVE INSERTS

- Remove threaded inserts by drilling out serrated insert collar with drill bit of same diameter as serrations. Drill at high speed to depth of first outer thread of insert.
- Drive in square-type "easy-out" tool; screw out insert.
- If insert does not unthread, collapse remaining portion with punch, and remove.

REMOVE STUDS AND LOCKRINGS

- Remove studs by milling out inner serrations of lockring and serrated stud collar from parent material.
- If lockring does not come out, collapse remaining portion with punch; remove lockring and stud.

INSTALL INSERTS, STUDS, AND LOCKRINGS

- Turn off all electrical power.
- Install threaded inserts, studs, and lockrings by positioning insert or stud in hole, and using a wrench to drive top surface of serrated collar 0.01-0.02 inch below surface of parent material.

NOTE

If applicable manufacturer's wrench is not available, use bolt and nut to drive insert, and stud driver to drive stud. Put driving force on nut for inserts.

- Install lockring until inner serrations engage outer serrations on insert or stud.

STEP 2 REPLACE INSERTS, STUDS, AND LOCK RINGS (CONT)

CAUTION

Do not drive lockring beyond top surface of serrations on insert or stud. Any pressure or hammering at this point may cause a loose installation of insert or stud. For soft materials, use drive tool with hammer; for medium-hard materials, use arbor press; for hard materials, use hydraulic press or steady ram.

- Use drive tool to drive lockring to a depth between top of insert/ stud serration and surface of parent material.
- Do an operational check and inspect related area for tight installation (TM 55-1520-237-23-3).

TASK 22
ENGINE MOUNTS - REPAIR (AVIM)

- **REPAIR AFT MOUNT STRUTS - STEP 1**
- **REPAIR AFT MOUNT FITTINGS - STEP 2**
- **REPAIR AFT MOUNT LINKS - STEP 3**
- **REPAIR AFT MOUNT SUPPORT - STEP 4**

PERSONNEL REQUIRED

- Two People Required: MOS 67T - Tactical Transport Helicopter Repairer
  MOS 68G - Aircraft Structural Repairer
  (STEPS 1, 2)

SUPPLIES

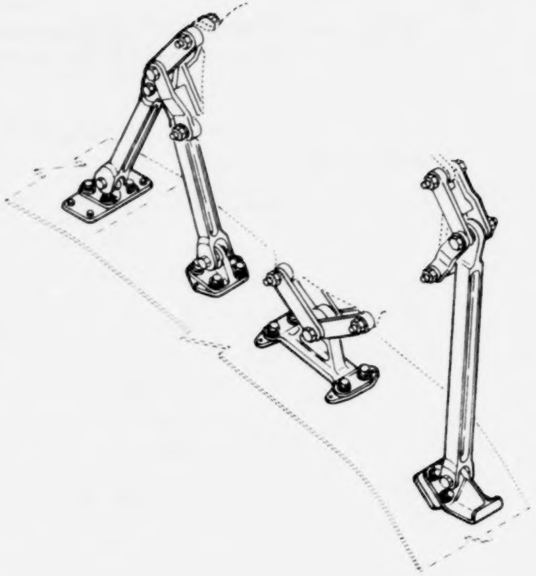
- Paint Remover, MIL-R-81294 (STEP 1)
- Primer, Fed. Spec TT-P-1757 (STEP 1)
- Sealing Compound, MIL-S-8802 (STEP 1)

TOOLS

- Abrasive Wheel, 1/2-inch-radius
- Arbor Press (STEP 1)
- Bushing Installation and Removal Kit, NSN 5108-00-980-2924 (STEP 1)
- Roller Staking Tool, STD 1850-458-024 (STEP 1)
- Sizing Block Set
- Staking Tool, STD 1850-458-019 (STEP 2)

ALSO NEEDED

- TM 43-0103 (STEPS 1, 2, 3, 4)
- TM 43-0105 (STEP 2)
- TM 55-1500-322-24 (STEPS 1, 2)


S 46189 (C3)

STEP 1 REPAIR AFT MOUNT STRUTS

NOTE

Strut repair consists of replacing bearings and bushings, inspecting, and refinishing.

REMOVE BEARING/BUSHINGS

- Remove bearing, using instructions in TM 55-1500-322-24.
- Remove bushing(s) from strut, using bushing installation and removal kit, NSN 5180-00-980-2924 and arbor press.

INSPECT STRUT

- Inspect strut for cracks per TM 43-0103. Replace strut if cracks are found.
- Measure bearing hole wear per applicable dimension in Table 22-1.
- Measure bushing hole wear per applicable dimension in Table 22-1.

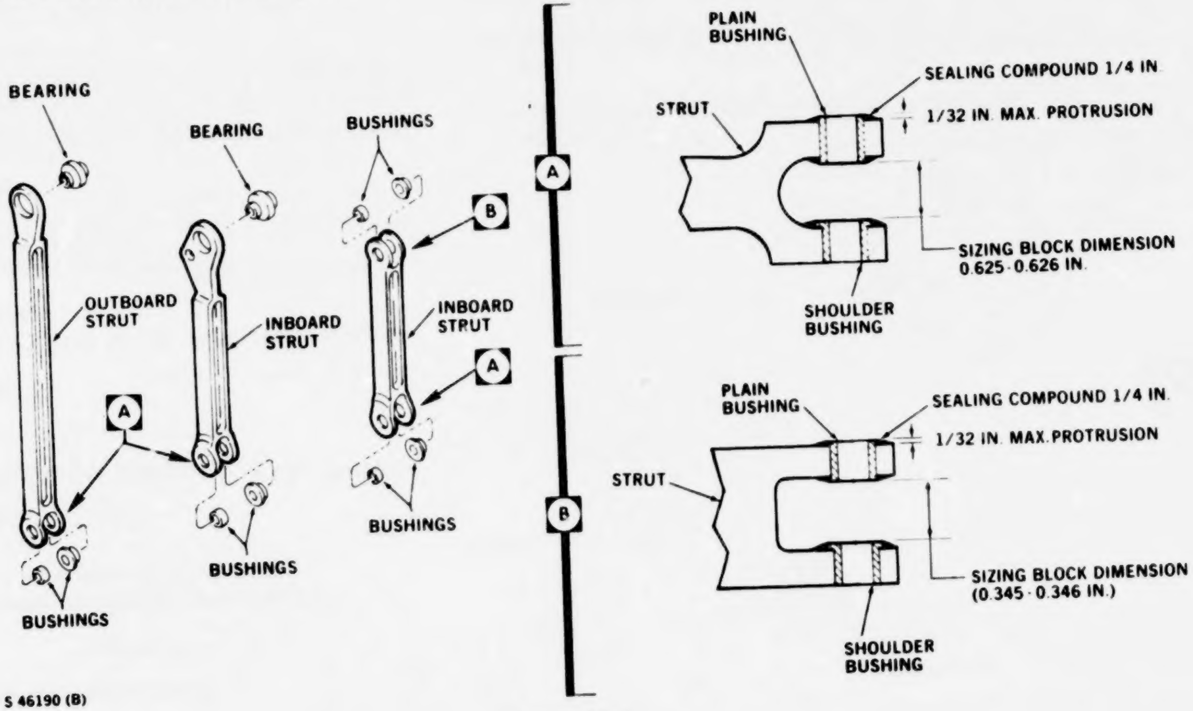
REFINISH STRUT

- Blend out nicks, gouges, and scratches using 1/2-inch-radius abrasive wheel. Blended area must not be over 1/4 inch long and 0.032 inch deep.
- Clean surface and apply epoxy primer, MIL-P-23377, to surfaces where plating was disturbed.

INSTALL BEARING/BUSHING

- Install bearing, using instructions in TM 55-1500-322-24.
- Stake bearing in housing, using roller staking tool, STD 1850-458-024.
- Coat bushings and strut bushing holes with primer, Fed. Spec TT-P-1757.
- Press bushing(s) into strut, using installation and removal kit, NSN 5180-00-980-2924 and arbor press. Remove extra primer.
- Put sealing compound, MIL-S-8802, around bushings as shown.

STEP 1 REPAIR AFT MOUNT STRUTS (CONT)


BEARING
BEARING
BUSHINGS
OUTBOARD STRUT
INBOARD STRUT
INBOARD STRUT
A
B
A
A
BUSHINGS
BUSHINGS
BUSHINGS
A
B
PLAIN BUSHING
SEALING COMPOUND 1/4 IN.
STRUT
1/32 IN. MAX. PROTRUSION
SIZING BLOCK DIMENSION 0.625-0.626 IN.
SHOULDER BUSHING
PLAIN BUSHING
SEALING COMPOUND 1/4 IN.
1/32 IN. MAX. PROTRUSION
STRUT
SIZING BLOCK DIMENSION (0.345-0.346 IN.)
SHOULDER BUSHING

S 46190 (B)

Figure 22-1

STEP 2 REPAIR AFT MOUNT FITTINGS

NOTE

> Fitting repair consists of replacing bearings, and inspecting and refinishing.

REMOVE BEARING

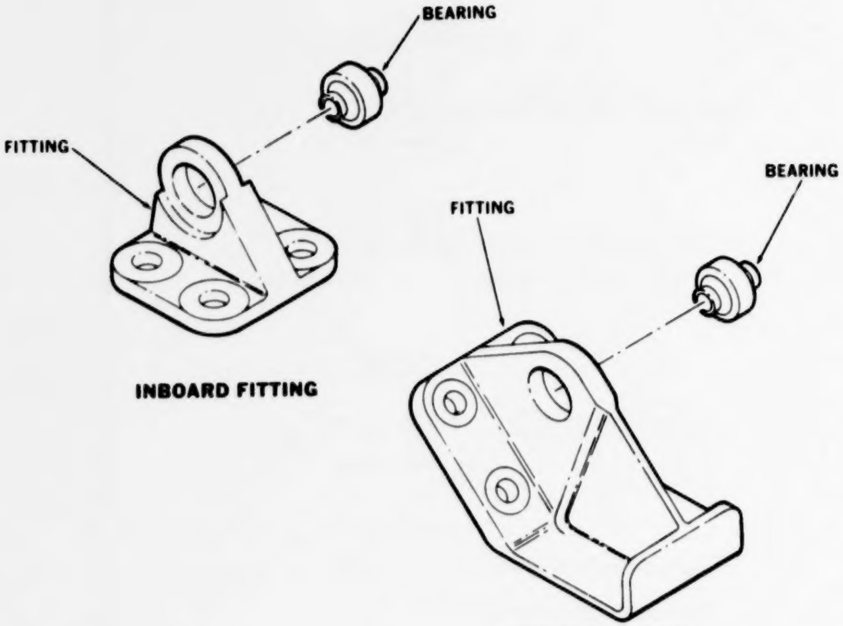
- Remove bearing per instruction in TM 55-1500-322-24.

INSPECT FITTING

- Remove paint from fitting using paint remover, MIL-R-81294.
- Inspect fitting for cracks per TM 43-0103. Replace fitting if cracks are found.

REFINISH FITTING

- Blend out nicks, gouges, and scratches on inboard fitting using 1/2-inch-radius abrasive wheel. Blended area must not be over 1/4 inch long and 0.032 inch deep.



INBOARD FITTING

OUTBOARD FITTING

S 46191 (B)

Figure 22-2

STEP 2 REPAIR AFT MOUNT FITTINGS (CONT)

- Blend out nicks, gouges, and scratches on outboard fitting using 1/2-inch-radius abrasive wheel. Blended area must not be over 1/2 inch long and 0.032 inch deep.
- Clean surface and apply epoxy primer, MIL-P-23377, to surfaces where plating was disturbed per instructions in TM 43-0105.

INSTALL BEARING

- Install bearing per instructions in TM 55-1500-322-24.
- Stake bearing in housing using staking tool, STD 1850-458-019.

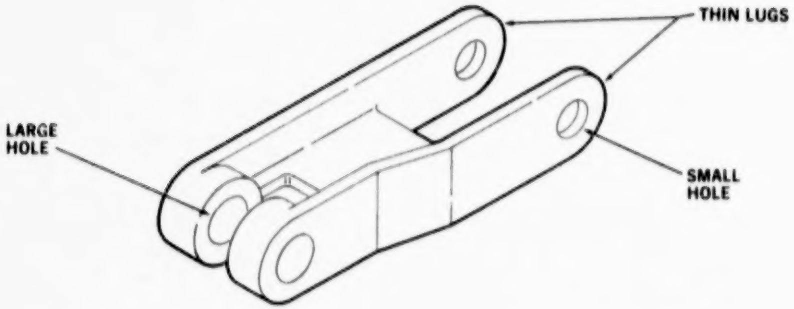
STEP 3 REPAIR AFT MOUNT LINKS

INSPECT LINK

- Measure for wear in holes at both ends of link per Table 22-1.
- Inspect link in area of thin lugs for nicks or gouges. **NICKS OR GOUGES MUST NOT BE MORE THAN 0.020 INCH DEEP.** Blend and polish nicks or gouges less then 0.020 inch.
- Inspect link for cracks, using fluorescent penetrant method per TM 43-0103. Replace link if cracks are found.

REFINISH LINK

- Blend out nicks, gouges, and scratches not in area of thin lugs using 1/2-inch-radius abrasive wheel. Blended area must not be over 1/2 inch long and 0.032 inch deep.



S 57251 (C15)

Figure 22-3

STEP 3 REPAIR AFT MOUNT LINKS (CONT)

TABLE 22-1 - MAXIMUM ALLOWABLE HOLE DIMENSIONS FOR ENGINE FITTINGS AND STRUTS

PART NUMBER	-101	-102	-103
70305-02105 - Bearing Hole	.9063	.9063	
- Bushing Hole	.4376	.4376	
- Unbushed Hole	.3150	.3142	
70305-02106 - Bearing Hole	.9063	.9063	
- Bushing Hole	.4376	.4376	
70305-02107 - Large Hole	.504	.503	
- Small Hole	.3775	.3757	
70305-02110 - Bearing Hole	.6878	.6878	
70305-02111 - Bearing Hole	.6878	.6878	

STEP 3 REPAIR AFT MOUNT LINKS (CONT)

TABLE 22-1 - MAXIMUM ALLOWABLE HOLE DIMENSIONS FOR ENGINE FITTINGS AND STRUTS (CONT)

PART NUMBER	-101	-102	-103
70305-02115 - Unbushed Hole	.635	.635	.635
70305-02119 - Bushing Hole	.4376	.4376	
70305-22112 - Bushing I.D.	.300	.300	
- Bushing O.D.	.4396	.4396	
70305-02112 - Bushing I.D.	.3140	.3140	
- Bushing O.D.	.4386	.4386	

STEP 4 REPAIR AFT MOUNT SUPPORT

INSPECT SUPPORT

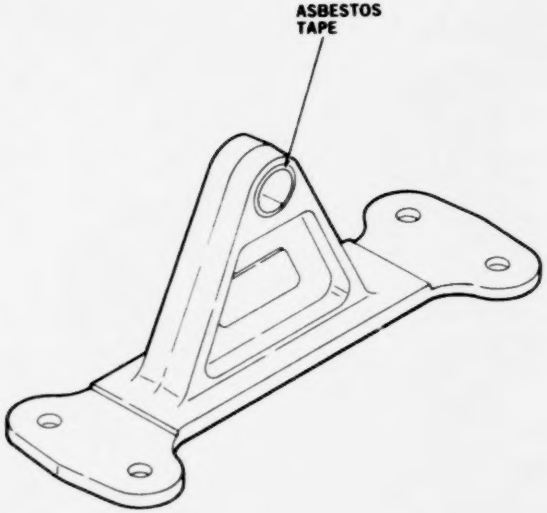
- On 70305-02115-042, -043 supports only, inspect bolt attachment hole for damage to asbestos tape. Remove and discard tape if loose, missing or worn through to support. Do not replace tape.
- Inspect support for cracks using flourescent penetrant method per TM 43-0103. Replace support if cracks are found.

REPAIR SUPPORT

- Deleted

REFINISH SUPPORT

- Blend out nicks, scratches, and gouges on support. Blended area must not be over 1/4 inch long and 0.032 inch deep.



S 57252 (C3)

Figure 22-4

TASK 23

ROTARY INPUTS - MAINTAIN (AVIM)

- **DISASSEMBLE - STEP 1**
- **INSPECT - STEP 2**
- **ASSEMBLE - STEP 3**

PERSONNEL REQUIRED

- One Person Required: MOS 67T - Tactical Transport Helicopter Repairer

SUPPLIES

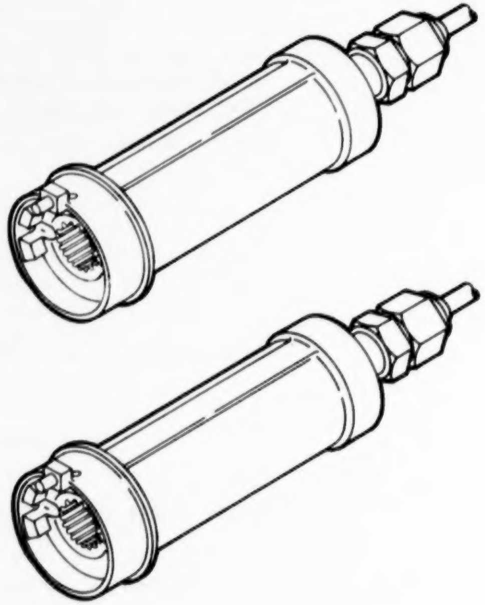
- Crocus cloth, Fed. Spec P-C-458 (STEP 2)
- Dry-cleaning solvent, Fed. Spec P-D-680, Type II, NSN 6850-00-274-5421 (STEP 2)
- Grease, MIL-G-81827 (STEP 3)

TOOLS

- Aircraft Mechanic's Toolkit, NSN 5180-00-323-4692
- Spring Tester, NSN 5120-00-937-7265 (STEP 2)

ALSO NEEDED

- TM 43-0103 (STEP 2)
- TM 55-1500-204-25/1 (STEPS 2, 3)



5 57595 (C6)

STEP 1 DISASSEMBLE

DISASSEMBLE

CAUTION

Do not attempt to remove the rotary input adapter from the housing, as galling of the threaded area could result.

- Place rotary input in padded vise.
- Remove snaprings from front bearing.
- Pull front bearing from housing.
- Remove rotary barrel and input drive from housing.
- Remove spring from adapter (only on load-demand input).
- Remove rollers from input drive.
- Deleted.
- If necessary, drive pin out of housing with hammer and suitable drift.

STEP 2 INSPECT

INSPECT

CAUTION

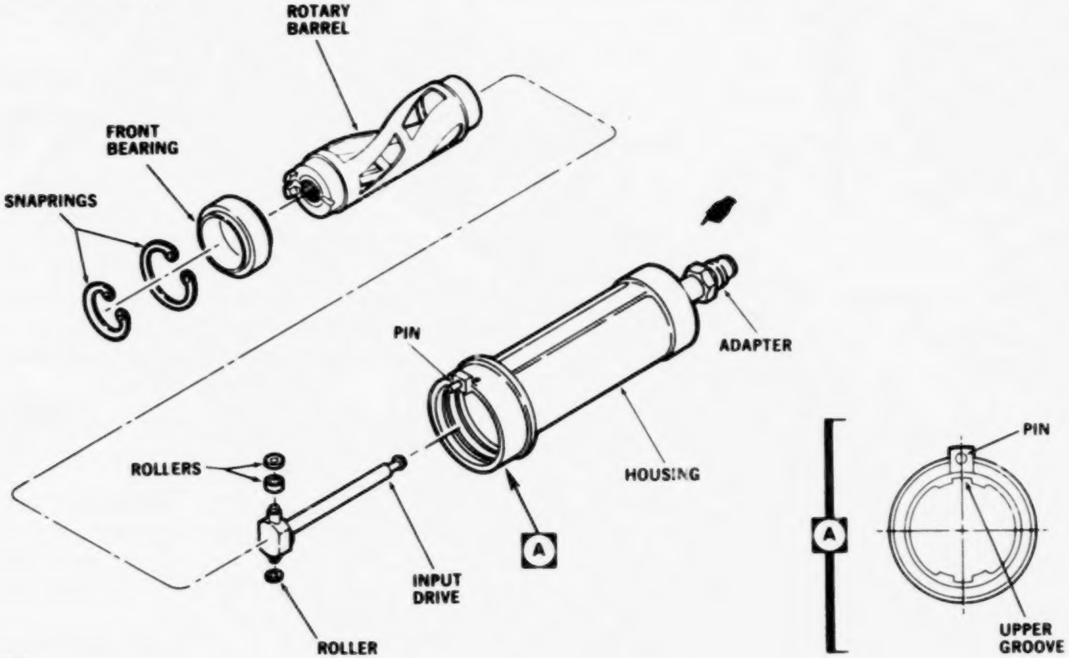
Do not allow dry-cleaning solvent into rear bearing area of adapter because breakdown of grease would occur.

- Clean adapter front bearing/snap-ring groove area with dry-cleaning solvent, Fed. Spec. P-D-680, Type II.
- Clean remaining parts with dry-cleaning solvent, P-D-680, Type II.
- Inspect bearings per TM 55-1500-204-25/1.
- Check spring for wear with spring tester. **SPRING PRESSURE MUST BE AT LEAST 23 POUNDS WHEN SPRING IS COMPRESSED TO 1.250-INCHES.** If spring pressure is less than 23 pounds, replace spring.
- Check outside of housing for scratches, guges, or corrosion. Blend scratches and gouges out with 1-inch diameter abrasive wheel. Clean corrosion with crocus cloth, Fed. Spec P-C-458.

STEP 3 ASSEMBLE

- Lubricate all internal parts except rear bearing with grease, MIL-G-81827.
- Deleted.
- Install rollers on input drive.
- Deleted.
- Place input drive in rotary barrel. The side of input drive with two rollers fits into narrow slot in rotary barrel.
- Install spring on input drive (load-demand input only).
- Slide rotary barrel and input drive into housing from front to rear. Make sure input drive end fits into adapter and spring fits around pilot on adapter (load-demand input only).
- Make sure rollers on input drive fit in slots on housing, and that side of input drive with 2 rollers is in upper groove.
- Install front bearing in housing (TM 55-1500-204-25/1).
- Install snaprings in housing and on rotary barrel.
- If pin was removed, press new pin into housing.
- Check assembled rotary input for smooth operation.

STEP 3 ASSEMBLE (CONT)


ROTARY BARREL
FRONT BEARING
SNAPRINGS
PIN
ADAPTER
HOUSING
ROLLERS
INPUT DRIVE
ROLLER
A
A
PIN
UPPER GROOVE

S 57596 (C18)

Figure 23-1

STEP 3 ASSEMBLE (CONT)

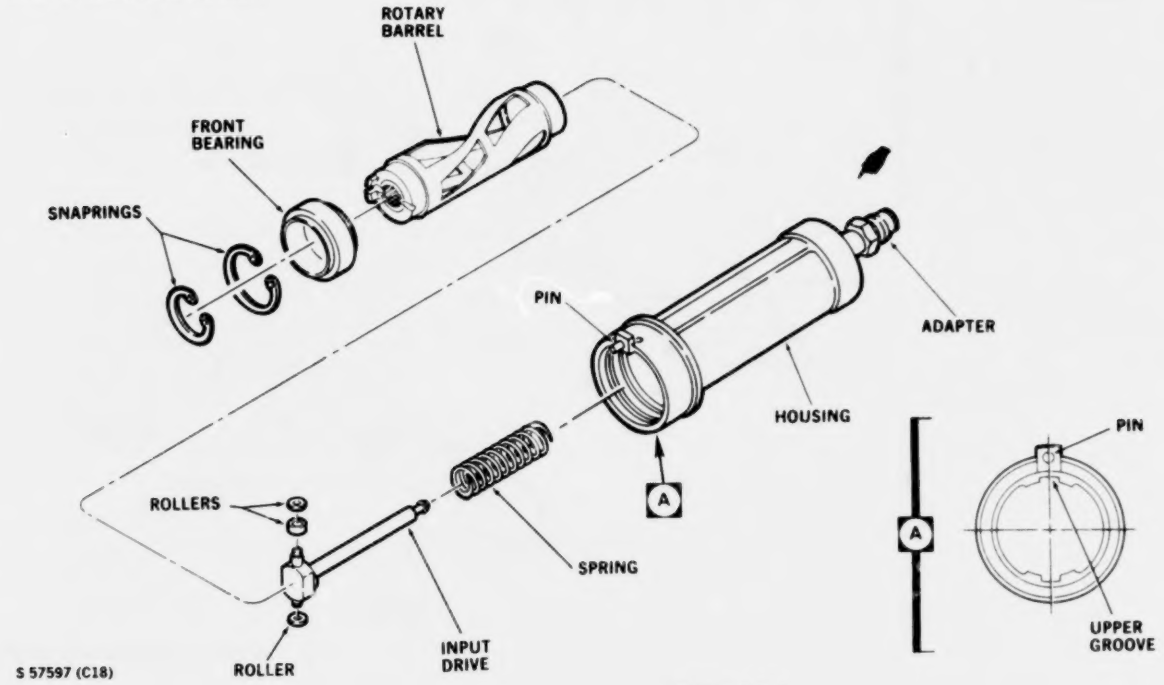

ROTARY BARREL
FRONT BEARING
SNAPRINGS
PIN
ADAPTER
HOUSING
A
PIN
A
ROLLERS
SPRING
UPPER GROOVE
ROLLER
INPUT DRIVE
S 57597 (C18)

Figure 23-2

TASK 24

FUEL CELL - MAINTAIN (AVIM)

- **REPLACE BALLISTIC RING - STEP 1**

PERSONNEL REQUIRED

- One Person Required: MOS 68G - Aircraft Structural Repairer

SUPPLIES

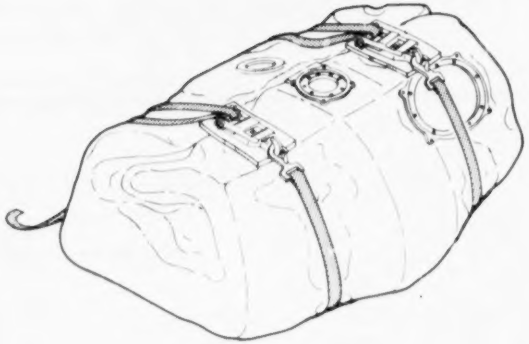
- Abrasive Cloth, 80-grit, P-C-451, Type 1
- Ballistic Ring P/N ACA 8002053
- Cement, 82C18, Parts 1 and 2
- Masking Tape, Fed. Spec PPP-T-42
- Methyl Ethyl Ketone, Fed. Spec TT-M-261
- Release Agent, MIL-W-18723

TOOLS

- Key Set, NSN 5120-00-935-4641
- Knife, NSN 5100-00-595-8403

ALSO NEEDED

- Clamping and Locating Device, P/N 320-4-44816
- TASK 15
- TM 55-1500-204-25/1



S 67273 (C11)

STEP 1 REPLACE BALLISTIC RING

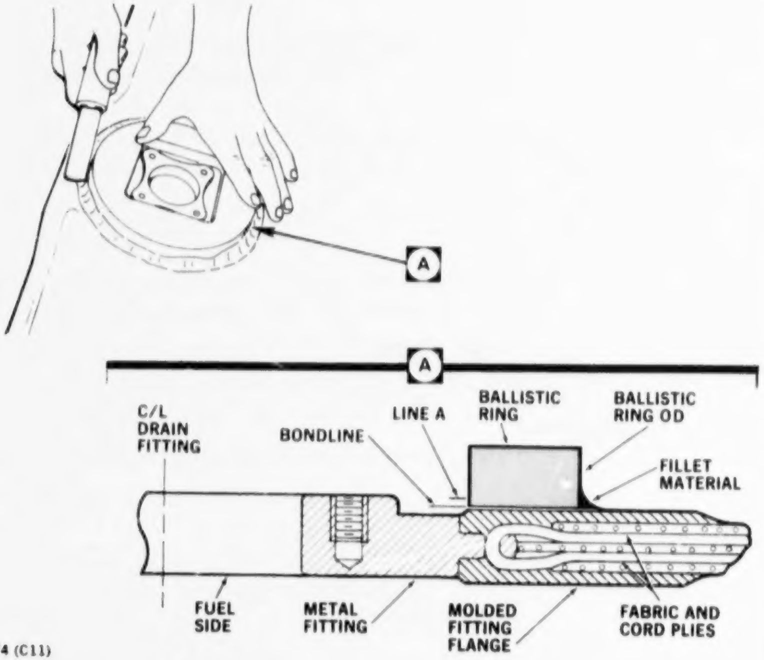
NOTE

Replacement of the ballistic ring is the same for both fuel cells.

- Remove fuel cell (TASK 15).
- Cover mating surface of all metal fittings with masking tape, Fed. Spec PPP-T-42.
- Clean fuel cell (TM 55-1500-204-25/1).
- Position cell with drain fitting and ballistic ring up.

CAUTION

To prevent damage to fuel cell, do not cut into molded fitting flange fabric or cord plies. Damage to fabric or cord plies requires replacement of fuel cell.


A
A
C/L
DRAIN
FITTING
BONDLINE
LINE A
BALLISTIC
RING
BALLISTIC
RING OD
FILLET
MATERIAL
FUEL
SIDE
METAL
FITTING
MOLDED
FITTING
FLANGE
FABRIC AND
CORD PLIES

S 67274 (C11)

Figure 24-1

STEP 1 REPLACE BALLISTIC RING (CONT)

NOTE

Ballistic ring material at cutline will be glossy purple. Molded fitting flange material at cutline will be dull black. If material on tank wall at the cutline is dull black, you are cutting too deep.

- Using knife blade, make cut parallel to bondline and between bondline and Line A (Figure 24-1). Once cut is made, pry up one end of ballistic ring to permit visibility and continue cutting from OD toward ID, until ballistic ring is removed.

CAUTION

To prevent damage to fuel cell, do not buff into molded fitting flange fabric or cord plies.

- Remove remaining bondline cement or ballistic ring material from tank using 80-grit abrasive cloth, Fed. Spec P-C-451, Type I.

NOTE

Buffing should be uniform and enough to cover area with fine scratches.

- Buff tank wall 3/4-inch larger in every direction than area where ballistic ring is to be bonded.
- Clean buffed area with cloth dampened with methyl ethyl ketone, Fed. Spec TT-M-261.
- Buff dull side and OD surfaces of new ballistic ring using 80-grit abrasive cloth, Fed. Spec P-C-451, Type I.
- Clean buffed area with cloth dampened with methyl ethyl ketone, Fed. Spec TT-M-261.
- Disassembly locating and clamping device, 320-4-44816.

NOTE

Be careful not to touch coated surfaces or allow release agent to contact buffed and cleaned surfaces to be bonded.

STEP 1 REPLACE BALLISTIC RING (CONT)

- Apply light coat of release agent, MIL-W-18723, to gasket and side surfaces of locating plate.
- Attach locating plate to fuel sump drain fitting with screws (Figure 24-2). **TIGHTEN SCREWS UNTIL SHARP RISE IN TORQUE IS FELT.**
- Mix cement, 82C18 Parts 1 and 2, per manufacturer's specification.
- Apply an even coat of cement to prepared mating surfaces of ballistic ring and tank.
- Position ballistic ring, coated side down, on tank.
- Apply light coat of release agent, MIL-W-18723, to cutout side of clamping plate.
- Position clamping plate, coated side down, over ballistic ring, with studs protruding through clamping plate.
- Secure clamping plate to locating plate with wingnuts. Tighten wingnuts fingertight.

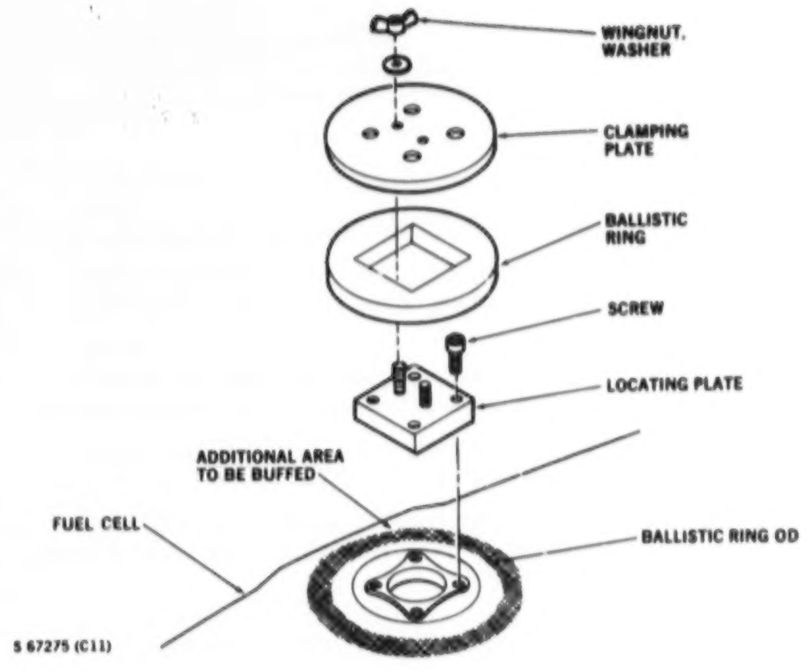

WINGNUT, WASHER
CLAMPING PLATE
BALLISTIC RING
SCREW
LOCATING PLATE
ADDITIONAL AREA TO BE BUFFED
FUEL CELL
BALLISTIC RING OD
S 67275 (C11)

Figure 24-2

STEP 1 REPLACE BALLISTIC RING (CONT)

- Smooth extra cement at ballistic ring OD into a fillet.
- Fill voids at ballistic ring OD with remaining cement and smooth into a fillet.
- Allow cement to cure for at least 6 hours, at not less than 70°F.
- Remove wingnuts, clamping plate, and locating plate from fuel cell.
- Deleted.
- Remove tape from metal fittings.
- Install fuel cell (TASK 15).

TASK 25
QUADRANT ASSEMBLY - REPAIR (AVIM)

- **REPLACE/REPAIR ENGINE POWER CONTROL LEVER - STEP 1**
- **REPLACE FIRE EXTINGUISHER T-HANDLE AND FUEL CONTROL LEVER - STEP 2**
- **REPLACE/ADJUST CANOPY PLUNGER - STEP 3**
- **REPLACE THREADED INSERT - STEP 4**

PERSONNEL REQUIRED

- Three People Required: MOS 67T - Tactical Transport Helicopter Repairer
  MOS 68F - Aircraft Electrician
  MOS 68G - Aircraft Structural Repairer (STEP 4)

SUPPLIES

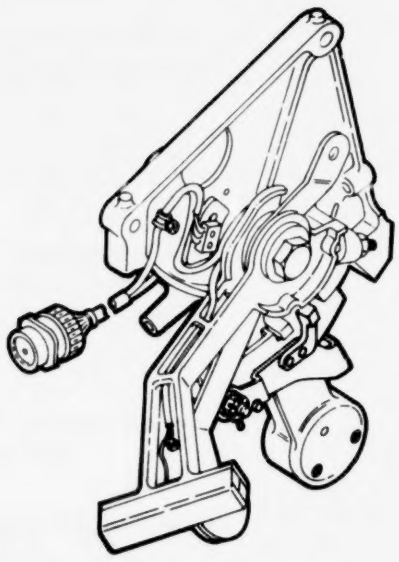
- Cotter pin, MS24665-155 (STEP 1)

TOOLS

- Arbor Press, If Required (STEP 1)
- Drill Press, NSN 3413-00-529-0809 (STEP 4)
- Insert Repair Kit, NSN 5180-00-177-8966 (STEP 4)
- Insert Repair Kit, NSN 5180-00-177-8968 (STEP 4)
- Insert Repair Kit, NSN 5180-00-178-0046 (STEP 4)

ALSO NEEDED

- TM 55-1520-237-23-1 (STEP 2)
- TM 55-1520-237-23-9 (STEPS 1, 2)
- TM 55-1500-204-25/1 (STEP 1)



S 67331 (E334)

STEP 1 REPLACE/REPAIR ENGINE POWER CONTROL LEVER

REMOVE

NOTE

> The following procedures apply to both No. 1 and No. 2 quadrants. When maintaining No. 1 and No. 2 quadrants, keep parts separate.

- Remove override and abort switches from engine power control lever (TM 55-1520-237-23-9).
- Remove nut and washers from bolt.
- Slide lever from bolt.
- Remove bushing and laminated shim from lever.

REPAIR

NOTE

> There are two small compressed springs in the lever assembly. Be careful when removing cover so as not to lose springs.

- Remove nut and washer from latch stop.
- Remove bolt and washer from torsion spring and latch stop.
- Remove torsion spring and latch stop from lever assembly.
- Remove screws and cover from lever.
- Remove lever from handle.
- Remove springs and latch from lever.
- Remove abort switch screw and spring from handle.
- Remove pin from starter button and remove button and spring from handle.
- Remove plunger from handle.

INSPECT

- **CHECK WEAR OF BUSHING FOR MAXIMUM ID OF 0.375 INCH.** If ID is worn beyond tolerance, replace bushing (Figure 25-1).
- Inspect bearing in lever (TM 55-1500-204-25/1).
- If required, press bearing from lever, using an arbor press.

STEP 1 REPLACE/REPAIR ENGINE POWER CONTROL LEVER (CONT)

INSTALL

- If bearing was removed, install new bearing in lever, using an arbor press.
- Position plunger in handle.
- Install starter button and spring on plunger, using pin.
- Position abort switch screw and spring in handle.
- Install nut and washer on abort switch screw.
- Place latch in spring and install latch and spring, as an assembly, in slot of lever assembly.
- Install spring in slot of lever.
- Position lever in handle.
- Install cover on lever, using screws.
- Position torsion spring on lever assembly.
- Install latch stop on lever assembly then engage torsion spring (Figure 25-2).
- Install bolt, washers, and nut, holding assembly in place.
- Install cotterpin, MS24665-1012, in nut.

NOTE

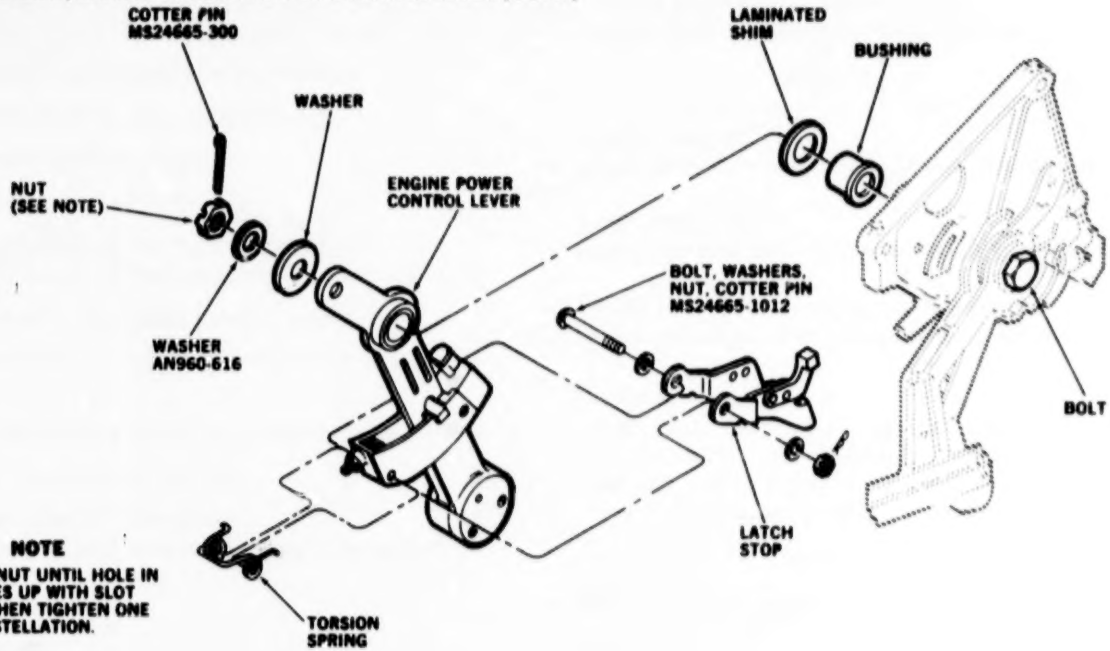
If a new laminated shim is being installed, peel laminations as required to obtain minimum clearance between parts, with control lever moving freely, without drag.

- Install laminated shim, with stainless steel side facing engine power control lever, on bushing.
- Install bushing and laminated shim in engine power control lever.
- Install engine power control lever on bolt with washers and nut.

NOTE

Shim with AN960-616 washers as required to properly install cotter pin.

STEP 1 REPLACE/REPAIR ENGINE POWER CONTROL LEVER (CONT)


COTTER PIN
MS24665-300
WASHER
NUT
(SEE NOTE)
ENGINE POWER
CONTROL LEVER
WASHER
AN960-616
LAMINATED
SHIM
BUSHING
BOLT, WASHERS,
NUT, COTTER PIN
MS24665-1012
BOLT
LATCH
STOP
TORSION
SPRING

NOTE

TIGHTEN NUT UNTIL HOLE IN BOLT LINES UP WITH SLOT IN NUT. THEN TIGHTEN ONE MORE CASTELLATION.

S 67332 (E334)

Figure 25-1

STEP 1 REPLACE/REPAIR ENGINE POWER CONTROL LEVER (CONT)

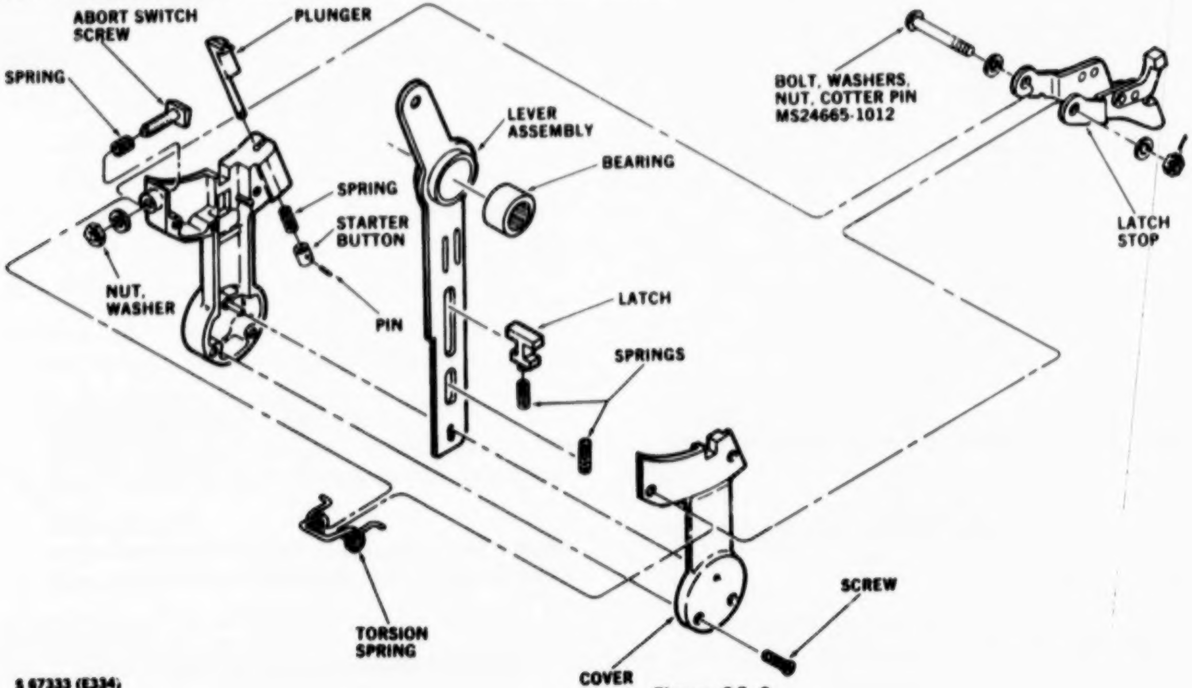

ABORT SWITCH SCREW
PLUNGER
SPRING
LEVER ASSEMBLY
BEARING
SPRING
STARTER BUTTON
NUT, WASHER
PIN
LATCH
SPRINGS
BOLT, WASHERS, NUT, COTTER PIN MS24665-1012
LATCH STOP
TORSION SPRING
SCREW
COVER
S 67333 (E334)

Figure 25-2

STEP 1 REPLACE/REPAIR ENGINE POWER CONTROL LEVER (CONT)

- **TIGHTEN NUT UNTIL HOLE IN BOLT LINES UP WITH SLOT IN NUT. THEN TIGHTEN ONE MORE CASTELLATION.**
- Move engine power control lever, fire extinguisher T-handle, and fuel control lever, and check for binding or looseness.
- If handles or levers bind, or are too loose add, or remove shims as required.
- Install cotter pin, MS24665-300, in nut.
- Install override and abort switches (TM 55-1520-237-23-9).

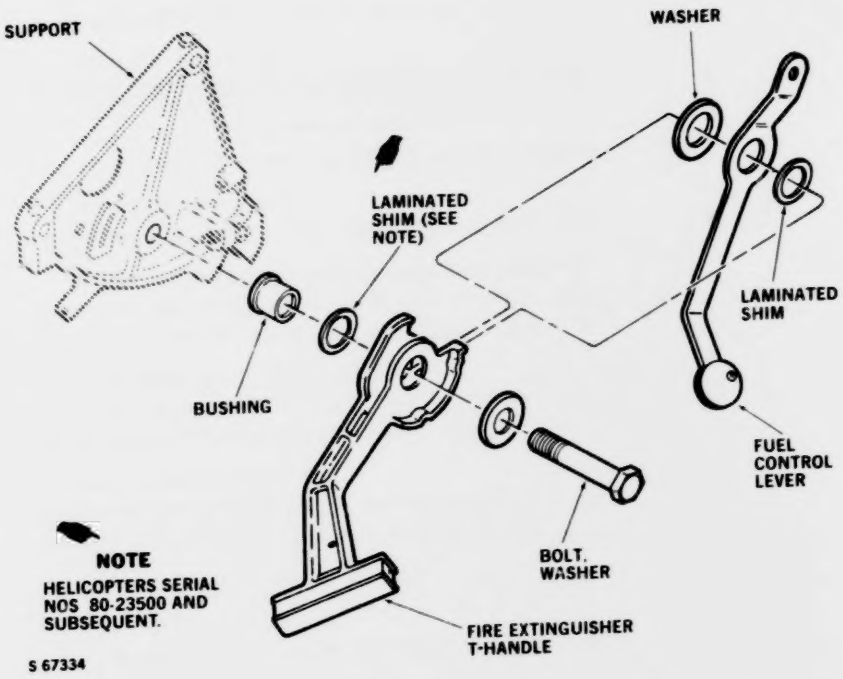
STEP 2 REPLACE FIRE EXTINGUISHER T-HANDLE AND FUEL CONTROL LEVER

REMOVE

NOTE

The following procedures apply to both No. 1 and No. 2 quadrants.

- Remove fire extinguishing and starter switches (TM 55-1520-237-23-9).
- Remove engine power control lever (STEP 1).
- Slide bolt, fire extinguisher T-handle, and fuel control lever, as an assembly, from support.
- Remove bolt and washer from T-handle and fuel control lever.
- Remove bushing from T-handle and fuel control lever.
- On helicopters serial Nos 80-23500 and subsequent, remove laminated shim from bushing.
- Deleted.


SUPPORT
WASHER
LAMINATED SHIM (SEE NOTE)
LAMINATED SHIM
BUSHING
FUEL CONTROL LEVER
BOLT, WASHER
FIRE EXTINGUISHER T-HANDLE
S 67334

NOTE
HELICOPTERS SERIAL NOS 80-23500 AND SUBSEQUENT.

Figure 25-3

STEP 2 REPLACE FIRE EXTINGUISHER T-HANDLE AND FUEL CONTROL LEVER (CONT)

- Remove fuel control lever, washer, and laminated shim from fire extinguisher T-handle. Tag shim for assembly.
- Remove electrical connector from electrical wires (TM 55-1520-237-23-1).
- Carefully remove electrical tubing insulation from wire bundle.
- Remove T-handle wire from wire bundle.

INSPECT

- Check ID of fire extinguisher T-handle bushing for maximum wear of 0.375-inch. If wear is beyond tolerance, replace bushing.

INSTALL

- Position wire from fire extinguisher T-handle in wire bundle.
- Measure and cut electrical wire to correct length.
- Install electrical tubing insulation on wire bundle.
- Connect electrical wire to electrical connector (TM 55-1520-237-23-1).
- Remove tag from laminated shim.
- If a new laminated shim is being installed, peel laminations as required to obtain minimum clearance between parts.
- Position fuel control lever, washer, and laminated shim, with stainless steel side of shim against lever, between ears of T-handle.
- On helicopters serial Nos 80-23500 and subsequent, install laminated shim with stainless steel side facing fire extinguisher T-handle on bushing.
- Install bushing through T-handle, washer, fuel control lever, and shim.
- Install bolt and washer through T-handle and fuel control lever. Install shim on bolt.
- Slide bolt, T-handle, and fuel control lever, as an assembly, in support.
- Install engine power control lever (STEP 1).

STEP 2 REPLACE FIRE EXTINGUISHER T-HANDLE AND FUEL CONTROL LEVER (CONT)

- Deleted.
- Deleted.
- Install fire extinguishing and starter switches (TM 55-1520-237-23-9).

STEP 3 REPLACE/ADJUST CANOPY PLUNGER

REMOVE

- Remove jamnut and washer from canopy plunger.
- Remove canopy plunger from fitting on support.

INSTALL

- Position fire extinguisher T-handle so detent is lined up with hole in fitting.
- Thread canopy plunger into fitting until plunger is lightly touching detent in handle.
- Install jamnut and washer on canopy plunger. Do not tighten jamnut now.
- Using a spring scale attached to T intersection of handle, move handle through full range of travel while adjusting canopy plunger. Adjust plunger until a force of 5-7 pounds is obtained to move plunger from detents.
- **TIGHTEN JAMNUT 1/6 TO 1/3 TURN PAST POINT WHERE SHARP RISE IN TORQUE IS FELT.**

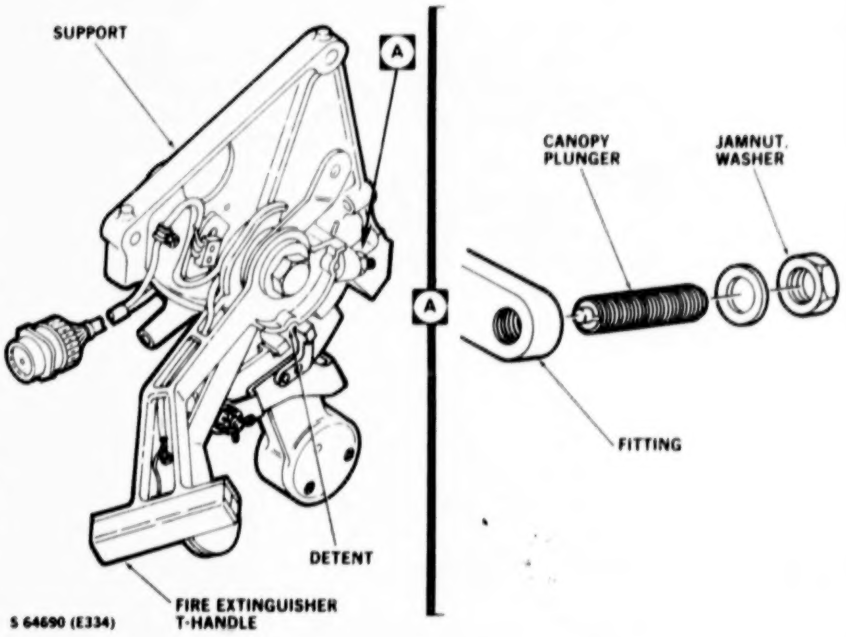

SUPPORT
A
CANOPY PLUNGER
JAMNUT, WASHER
A
FITTING
DETENT
FIRE EXTINGUISHER T-HANDLE
S 64690 (E334)

Figure 25-4

STEP 4 REPLACE THREADED INSERT

INSPECT

- Check threaded insert for proper engagement of support and broken or cracked threads. **IF INSERT IS LOOSE, BROKEN, OR CRACKED, REPLACE IT.**

REMOVE

NOTE

Removal and installation of all threaded inserts is the same except as noted. Use tool kit, 5180-00-177-8966, for insert, SR162L, tool kit, 5180-00-177-8968, for insert, SR192L, and tool kit, 5180-00-178-0046, for insert, SR258L.

- To remove inserts from support, do this:
  - Install required removal bit from tool kit in drill press, 3413-00-529-0809.
  - Using drill press and removal bit, **DRILL TO A DEPTH OF 0.090 INCH,** for insert, SR162L.
  - Using drill press and removal bit, **DRILL TO A DEPTH OF 0.107 INCH** for inserts, SR192L, and SR258L.

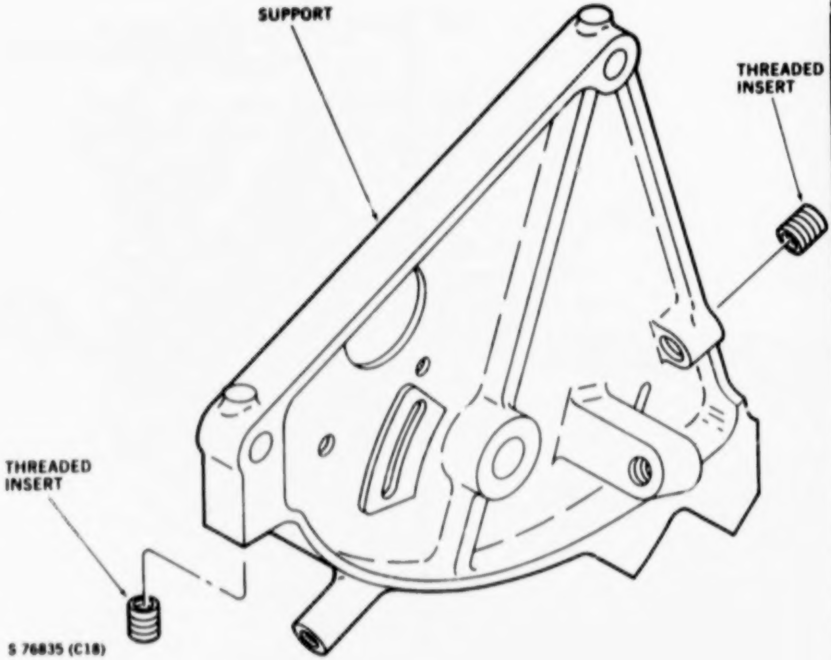


Figure 25-5

STEP 4 REPLACE THREADED INSERT (CONT)

- Using installation wrench, turn insert counterclockwise and remove insert.
- Use clean, dry compressed air to remove any loose chips from hole.

INSTALL

- To install insert in support, do this:
  - Using installation wrench, thread insert, SR162L, into hole until top of insert is **0.010 - 0.020 INCH BELOW BOSS SURFACE OF SUPPORT**.
  - Using installation wrench, thread insert, SR192L, or SR258L, into hole until top of insert is **0.015 - 0.025 INCH BELOW BOSS SURFACE OF SUPPORT**.
  - Insert swage tool in insert and apply downward pressure until shoulder of tool is bottomed against boss surface. **MAKE SURE SHOULDER IS BOTTOMED AGAINST BOSS SURFACE**.

TASK 26

ENGINE CONTROL CABLE SUPPORT - REPAIR (AVIM)

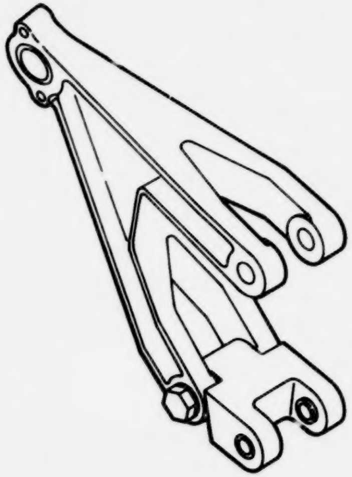
- **REPAIR LOAD DEMAND CABLE SUPPORT CLIP - STEP 1**

PERSONNEL REQUIRED
- One Person Required: MOS 68D - Aircraft Powertrain Repairer

SUPPLIES
- Crocus Cloth, P-C-458
- Paint, Green, MIL-L-46159, NSN 8010-00-083-6588
- Paint Remover, MIL-R-25134
- Primer, Epoxy, MIL-P-23377
- Scraper, Plastic
- Sealing Compound, MIL-S-8802
- Tape, Fed. Spec PPP-T-42

TOOLS
- Arbor Press
- Bushing Pusher
- Sizing Block

ALSO NEEDED
- TM 55-1500-345-23
- TM 43-0103 (MIL-I-6868)



S 64719 (C15)

STEP 1 REPAIR LOAD DEMAND CABLE SUPPORT CLIP

NOTE

Support clip repair consists of replacing bushings, inspection, and refinishing.

REMOVE BUSHINGS

NOTE

Replace bushings as a complete set of two per support clip.

- Remove bushings from support clip using suitable bushing pusher and arbor press.

INSPECT SUPPORT CLIP

- Remove sealant from bores in support clip with plastic scraper.
- Remove paint from support clip bores using paint remover, MIL-R-25134.
- Fluorescent penetrant inspect support clip for cracks (TM 43-0103). Replace support clip if cracks are found.
- Check for corrosion, galling, or scoring in support clip bushing bores. Smooth out any corrosion, galling, or scoring in support clip bushing bores using crocus cloth, P-C-458. **REPLACE CLIP IF DAMAGE IS DEEPER THAN 0.010 INCH AFTER BLENDING, OR IF BLENDED AREA IS GREATER THAN 25% OF BORE AREA.**
- Measure clip bore after blending. **REPLACE CLIP IF EITHER BORE IS LARGER THAN 0.3761 INCH.**

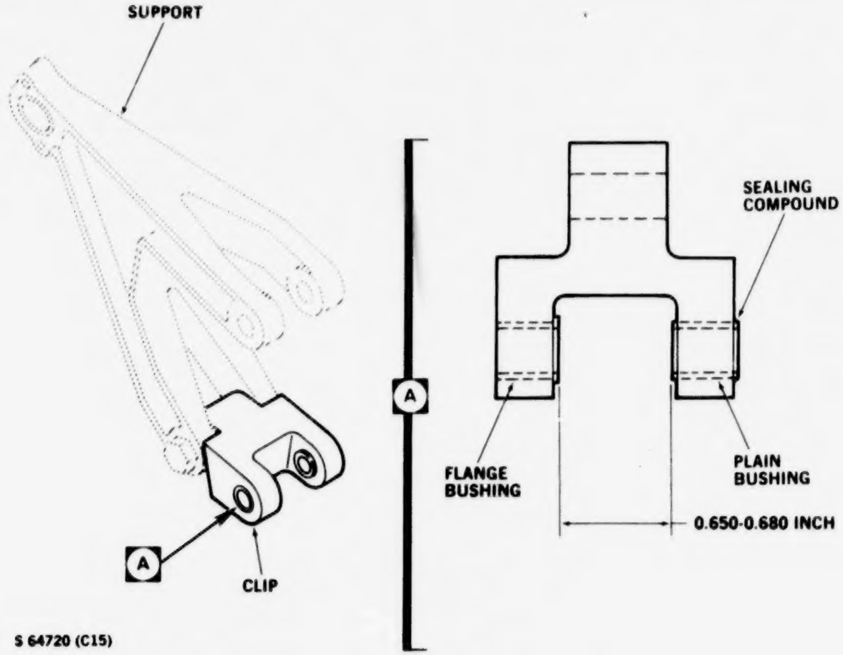
REFINISH SUPPORT CLIP

- Paint support clip as follows (TM-55-1500-345-23):
  - Mask bushing bores with tape, Fed. Spec PPP-T-42.
  - Apply one coat of primer, MIL-P-23377, to surface.
  - Apply two coats of green paint, MIL-L-46159.
  - Remove masking tape from bushing bores.

STEP 1 REPAIR LOAD DEMAND CABLE SUPPORT CLIP (CONT)

INSTALL BUSHINGS

- Locally make sizing block 0.650 to 0.680 inch.
- Coat bushings and support clip bushing bores with epoxy primer, MIL-P-23377.
- Using arbor press, press bushings into clip bores while primer is still wet. Remove any excess primer. Check for 0.650- to 0.680-inch block dimension (Figure 26-1).
- Seal bushings with sealing compound, MIL-S-8802 (Figure 26-1).


SUPPORT
A
CLIP
A
SEALING COMPOUND
FLANGE BUSHING
PLAIN BUSHING
0.650-0.680 INCH

S 64720 (C15)

Figure 26-1

✿ U.S.G.P.O. 1989 235-197/00283